THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The increasing strain of the coke embargo and the jumping of importations of pig iron to a rate of over 3,000 tons a day, as against 1,000 tons a day in June and 2,000 tons a day in July, are the features of the blast furnace situation. The pinch of fuel scarcity has not yet gone to the point of seriously affecting industries other than those engaged in producing or melting iron, but because the latter cannot deliver their products there are far reaching derangements. More foundries, particularly in the East, are shut down or on the verge of idleness than at any time since the trouble began. Coke supply for 1903 is a matter of immediate moment to many blast furnaces and foundries. The leading Connellsville producer has not named a price, but it is intimated that the basis will be somewhat less than the $4.25 independent producers are asking for foundry coke for 1903 and the $4 price which some companies have asked for furnace coke for next year. Denial has been made of the report that the United States Steel Corporation would cease to be a seller of coke and iron ore. Its facilities for coke production are being increased by the building of 3,000 ovens in West Virginia and 1,000 ovens in the Connellsville region. In the matter of ore the policy of conserving the supply of old range material was established last year, and apart from term contracts coming over from its constituent companies the corporation is selling practically nothing outside of Mesabi ores. The pig iron market has been comparatively dull the past week. For early shipment there is little iron but imported and the price of the latter is higher. Domestic iron for 1903 is well sold for the first half, and there is little desire on either side to do business for the second half. It is a question if the larger Southern producers will have any considerable amount to sell for any part of next year. Reported sales of No. 2 are at $20 and $21 Alabama furnace for the first half, and Northern furnaces ask from $21.50 to $22.50 at furnace for the same delivery. The steel situation is somewhat mixed. Foreign steel is quoted from $28 to $29.25 delivered in the Central West, but sales at the lower figure are not reported. An inquiry is up for 15,000 tons of billets to be imported for a Southern consumer. Domestic Bessemer billets have been sold at $31 Central Western delivery. The slackness in tin plate production and the closing down of some sheet mills, together with the accumulations of wire and wire nail stock, have been expected to result in increased offerings of Bessemer billets and sheet bars, but this does not appear as yet to be the case. There has been some compensation for the sheet and tin plate conditions in increased output of Bessemer shapes, particularly angles, and of light rails. A reduction of $5 a ton, effective until December 1, and applicable to gauges lighter than No. 18 in black and galvanized sheets, on 500 bundle lots, is announced this week, and is the result of the steady increase in sheet mill capacity. It is a question to what extent sheet mills buying steel in the market can meet such a cut. Tin plate quotations are not yet made for delivery beyond Dec. 1 and the possibility of some reduction here also has been discussed. In the bar trade specifications have been more plentiful. Some concessions on extras for iron have been reported, but the 1.80c basis Pittsburg is well maintained. Every week adds to the bookings of plate and structural mills. A new competitor for structural business in the Chicago district is announced. Increasing importations of structural steel are to be expected.

PITTSBURG.

OFFICE OF *The Iron Trade Review*, 429 PARK BUILDING, Oct 1.

The report that the United States Steel Corporation has decided to use its entire coke production for its own plants is given little credence here, and while not having been officially denied, it is understood that such a move is not even under consideration. It has been stated that about 400,000 tons of its coke production will be withdrawn from the market next year owing to the increasing demands of its own plants, but this is only a very small proportion of the 25 percent of its entire production now marketed. In addition the coke production of the corporation will be greatly increased about the first of the year by the lighting of about 3,000 ovens in West Virginia and in addition to this about 1,000 ovens are under construction in the Connellsville district. This increased production will more than take care of the increased demands of the various plants of the corporation and the day of the withdrawal of its surplus coke from the market is still some time in the future. It is extremely doubtful, indeed, if this move will ever be made owing to the reputation the coke now has in the open market. The first sales of coke for delivery the first half of next year were made this week. An independent coke producer sold a large block of foundry coke at $4.25 at the ovens which is a big increase over the contract price for foundry coke made early this year. On the other hand the independent producers have practically decided to ask $4 per ton for furnace coke for this delivery although it is stated on excellent authority that the H. C. Frick Coke Co. is considering a price somewhat lower than this. We have also been advised that some of the independent producers have decided to hold their foundry coke at $4.50 at the ovens and they feel sanguine that this price can be easily secured on account of the shortage that exists at present, and the shortage that is bound to exist early next year, despite the fact that the erection of new ovens is unprecedented in the history of the trade.

The delivery of coke to the furnaces in the Valleys and in this district during the past week was not nearly as good as in the previous week, but with few exceptions the furnaces succeeded in pulling through without being compelled to resort to banking. The production of pig iron is therefore not nearly up to the normal capacity and with each day the furnaces are getting further behind on their contracts. It was stated this week, by one of the operators in the Mahoning Valley, that with few exceptions the furnaces that have sold up their entire product through the first quarter of next year will not be in a position to take contracts for additional tonnage for delivery the second half of the year on account of the large amount that will be carried over into that quarter, from present indications.

That all the plate and structural mills are fast filling their books with orders for delivery next year, is indicated by the practical refusal of the mills in this district to accept an order for 60,000 tons of both kinds of material for delivery throughout 1903. The concern that is attempting to place the order is a large independent steel car manufacturer the bulk of whose tonnage for next year's delivery has already been placed. Unless some of

the mills in the East can offer proper deliveries for this material during at least the first half of next year it is probable that a large portion of the tonnage will be placed abroad.

The demand in finished lines was somewhat better during the past week and the situation in wire and wire nails is somewhat stronger. Specifications on steel bars are also somewhat heavier than they have been for some time and the volume of current business is also increasing.

There has been no additional buying of foreign Bessemer iron during the week and the reported refusal of a steel concern in this district to place a contract for 100,000 tons abroad on account of the analysis of the iron has been flatly denied. We note the sale of 8,000 tons of German steel at prices ranging from $29 to $29.25, Pittsburg.

PIG IRON.—Though high prices are asked by some of the furnace operators for Bessemer iron we note the sale of several carload lots at $22 at the furnace for immediate delivery. As high as $23 is asked by some of the operators for prompt iron and sales to the West have been reported on this basis. We also note the sale of 6,000 tons of Bessemer for delivery the first half of next year at $21 at the furnace which is somewhat lower than iron for this delivery is held by some furnaces. There is little doing in either forge or basic although we note the sale of 800 tons of the former at $21.80, Pittsburg. The demand for No. 2 foundry iron for prompt delivery continues strong at prices ranging from $24 to $25. We note the sale of 1,500 tons of No. 2 foundry for delivery the first six months of 1903 at $23, Pittsburg. Coke shipments during the past week were not nearly so good as during the previous week and several of the furnaces in the Valleys were again forced to bank for brief periods. While very little foreign foundry iron is being purchased in this market, the buying in the East is reported extremely heavy and it is probable that the deliveries to seaboard plants this month will be heavier than at any time this year. We revise quotations as follows:

Bessemer, Valley	$21 00 to 22 00
Bessemer, Pittsburg	21 75 to 22 75
No. 1 Foundry	23 50 to 24 00
No. 2 Foundry	22 75 to 23 25
No. 3 Foundry	22 25 to 22 50
Gray Forge, Pittsburg	21 50 to 21 75
Chilled Basic, Valley	20 75 to 21 00
Chilled Basic, Pittsburg	21 50 to 21 75

STEEL.—There is little buying of domestic Bessemer billets, although offerings continue to be made as low as $31, Pittsburg, on desirable tonnages. Open-hearth steel is being held at $33 for the same delivery. We note the sale of 8,000 tons of German steel on a basis of $29 to $29.25, Pittsburg, for delivery to points west of here. Lower quotations are reported on German steel, but the lower priced steel does not seem to sell. Bessemer rods are held at $35 per ton.

FERRO-MANGANESE.—We note the sale of a small tonnage of German manganese, 80 percent, at $51.25, Pittsburg. The domestic product is not being offered on the market at present.

SPELTER.—There has been no change in the spelter market and prime western grades are held at 5.35c to 5.37½c, Pittsburg.

MUCK BAR.—The market is quiet with heavy offerings of Eastern material at $35, Pittsburg. Local mills are holding their product at $35.50 to $36 at mill.

SKELP.—Heavy offerings of skelp by Eastern mills has resulted in another decline in the market and grooved and sheared skelp is now held at 2c to 2.05c. Some of the local plants have shut down their skelp rolling departments and are finding it more profitable to market their muck bar. Steel skelp is held at 2.15c.

RAILS AND TRACK MATERIAL.—The offerings of light rails on the market are somewhat heavier than they have been for some time and as a result prices are somewhat lower than they have been. We revise quotations as follows: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 8 pounds, $44; 12 pounds, $43; 16 pounds, $41; 20 pounds, $40; 25 to 40 pounds, $38 to $39. Track material: Spikes, 2c to 2.05c; track bolts, square heads, 2.50c; hexagon heads, 2.65c; fish plates, 1.60c.

PLATES.—A meeting of the plate manufacturers will be held in New York on Oct. 8, being the first meeting that has been called in six months. No change will be made in the price, however, as plates are selling from $5 to $8 a ton above the agreement quotations. The demand for plates for steel cars will be much heavier next year than ever before and it is probable that some of the steel will be rolled abroad owing to the inability of the mills in this country to take on the additional tonnage required. Local mills are quoting 1.85c on plates for delivery the remainder of the year and the first six months of next year, while agreement quotations continue unchanged as follows: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plate more than 100 inches wide, 5c extra 100 pounds. Plate 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5 cents extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

BARS.—The current demand for steel bars is much heavier than it has been for some time and specifications on running contracts are now being made by nearly all the large agricultural implement manufacturers. Iron bars continue firm on a basis of 1.80c to 1.85c, Pittsburg, the single company that has been quoting 2.05c to 2.10c having come to the lower basis. We make the following quotations: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer under 3 inches, 1.70c; over 3 inches, 1.80c; bar iron, 1.80c to 1.90c, Pittsburg, with full freight added to point of delivery. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots; refined iron bars, 2.25c and upwards.

PIPES AND TUBES.—The market in the larger sizes of pipe continues strong, but there is keen competition in the smaller sizes and prices are being shaded by the independent mills to some extent. Quotations to jobbers in carload lots, with freight added to destination, are as follows:

MERCHANT PIPE.

	Black Percent.	Galv. Percent.
⅛ to ½ and 11 to 12 inches	60	48
¾ to 12 inches	67	55

BOILER TUBES.

Steel.

	Percent.
1 to 1½ inches	45
2¼ to 5 inches	62½
1¼ to 2¼ and 6 to 12 inches	52½

Iron.

	Percent.
1 to 1½ inches	42½
2¼ to 5 inches	50
1¼ to 2¼ and 6 to 12 inches	40

CASING.

	S. and S. Percent.
2 to 3 inches	58
3½ to 4 inches	60
4½ to 12½ inches	63

SHEETS.—The American Sheet Steel Co. has made a five dollar reduction on all guages of black sheets on all orders calling for 500 bundle lots or over. This reduction is to hold until Dec. 1. A similar reduction is made on all guages of galvanized sheets to hold until the same date. No reduction, however, was made on blue annealed sheets. We make the following quotation on 500-bundle lots and over for black sheets, one pass through cold rolls: No. 28, 2.75c; No. 27, 2.65c; No. 26, 2.55c; Nos. 22 and 24, 2.45c; Nos. 18 and 20, 2.35c; Nos. 14 and 16, 2.25c; Nos. 10 and 12, 2.10c to 2.15c. Galvanized sheets are quoted 75 and 10 off.

WIRE AND WIRE NAILS.—While prices continue to be shaded on both wire and wire nails, the demand is stronger and the general situation is much better than it was a month ago. We make the following quotations: Wire nails in carload lots, $2.05 per keg; smaller lots, $2.10 and $2.15; plain wire, $2 in carload lots and $2.10 in less than carload lots; polished staples, $2.20, and galvanized staples, $2.60; painted barb wire, $2.60, and galvanized, $2.90. These

prices are quoted on a Pittsburg base plus the actual freight to destination. Cut nails are held at $2.05 in carload lots, and 2.10c in less than carload lots, Pittsburg, plus freight to destination.

MERCHANT STEEL.—A meeting of the shafting manufacturers will be held shortly, but there is no indication of a change in price. We make the following quotations: Turned cold rolled ground shafting in carload lots, 47 off, and in less than carload lots, 42 off; tire steel, 2.25c to 2.30c; toe calk, 2.35c to 2.45c; sleigh shoes, 2.25c to 2.35c; machinery steel, 1.70c; smooth machinery steel, 1.75c. Tool steel, 7 cents and upwards.

STRUCTURAL STEEL.—The demand for all kinds of structural material continues very heavy and the demand for material for steel car manufacture promises to be heavier during 1903 than ever before. Agreement quotations which are only applicable on next year's business are as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 6 inches, 1.60c; universal mill plates, 1.60c.

OLD MATERIAL.—The market continues very quiet, consumers still holding off on heavy orders on account of the prevailing prices. We revise quotations, gross tons, as follows: Heavy melting stock, $21.50 to $21.75; low phosphorus melting stock, $23.50 to $24; steel rails, $21.50 to $22; re-rolling rails, $23 to $23.50; No. 1 cast scrap, $19 to $19.50; borings and turnings, $10.50 to $11; busheling scrap, $17.

COKE.—For the week ending Saturday, Sept. 20, the production of the upper Connellsville region amounted to 256,350 tons, according to the Connellsville *Courier*, while the production of the lower region for the same period amounted to 47,070 tons. Despite this immense production the supply seems inadequate to fill the demand and fancy prices continue to be paid for coke for prompt shipment. We note the placing of a contract for foundry coke for delivery the first half of 1903 at $4.25 at the ovens, and it is probable that a price of $4 at the ovens will be fixed for furnace coke.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK Sept. 30

Though the condition of furnaces and mills is practically unchanged, so far as their output is concerned, a much easier tone prevails among both buyers and sellers. The panicky feeling which was so strong several weeks ago, appears to have entirely disappeared and the trade seems now to be settling down to make the best of a bad state of affairs. Quite a number of furnaces in the West and South are banked, and few of those that still keep in blast are working to their full capacity. The coke situation has not improved any during the week, except in a few isolated cases in the South, where a number of furnaces are reported to be making better shipments on contract iron. There is little domestic iron to be had for spot delivery, and sales of this class grow fewer in number each week. The demand for foreign iron by Western foundrymen in the next three months is certain to be much greater than at any time this year. Few furnaces will be able to meet the contract specifications for the last quarter of this year owing to the large tonnage which they have been unable to deliver in the quarter just closed.

In the finished material market, light sheets, bars and wire products are weak. There is plenty of business being placed, but not enough to keep all the mills in operation, and manufacturers are reported to be cutting prices freely. One Western sheet mill and a bar mill have shut down because of a reported lack of specifications, and an independent wire manufacturer in the West has kept its plant in operation only by working on orders for stock. Independent makers of merchant pipe are also making a keen fight for business in this territory, and are reported to be offering concessions from list prices. There is an active demand for plates, structural steel, light rails and track supplies, and prices on all these products are firm with a tendency upwards. Scrap iron is without change, though buying is not of excessive proportions. The Inland Steel Co., of this city, expects to put its structural mill in operation this week, thus affording some relief to consumers of beams and angles, on which the mill will have a capacity of 300 to 400 tons per day.

PIG IRON.—Indications point to a greater dependence on foreign iron in the next three months by Western foundrymen for relief from the conditions affecting the domestic product. A majority of the furnaces have managed to scrape together during the summer months enough coke to enable them to meet in part their contract specifications, but whether they can do so during the last quarter of the year is largely a matter of doubt. Most of the furnace operators believe not, and with three Northern and four Southern furnaces banked and others only in partial operation, their supposition carries with it a degree of conviction. Practically all the furnaces have run behind various amounts on their deliveries in the quarter just closed, and after Oct. 1 specifications for the fourth quarter will be coming in, with none of the furnaces in position to meet them. A majority of the foundrymen have thus far escaped the high prices, working almost entirely on iron bought at $15 and less, but the distress is certain to be more acute and widespread in the next three months. The coke situation in the West grows worse instead of better, though some furnaces in the South are reported to be receiving increased shipments, and have been making better deliveries on their contracts. Little spot iron of domestic make is being offered in this market, and sales do not exceed 500 tons a day. Neither is there much iron to be had for future delivery, furnaces being unwilling to sell anything under existing conditions. There were several thousand tons of Lake Superior charcoal sold several days ago, the iron going almost entirely to local foundries. Spot iron sells from $27.15 to $27.65 for No. 1 foundry; and those Southern furnaces that are selling for delivery next year are asking $21 Birmingham. The sales of foreign iron have been light in the past week, owing to the easier tone which has prevailed. For prompt delivery, it commands $27 to $28 a ton. There is such a wide spread in prices in the various selling offices that it is impossible to give exact quotations. The following are close to the market:

Lake Superior Charcoal	$27 00 to 28 00
Local Coke Foundry No. 1	23 50 to 24 00
Local Coke Foundry No. 2	23 00 to 23 50
Local Coke Foundry No. 3	22 50 to 23 00
Local Scotch Foundry No. 1	24 00 to 24 50
Local Scotch Foundry No. 2	23 50 to 24 00
Southern Coke No. 1	24 15 to 24 65
Southern Coke No. 2	23 65 to 24 15
Southern Coke No. 3	23 15 to 23 65
Southern Coke No. 4	22 65 to 23 15
Southern No. 1, soft	24 15 to 24 65
Southern No. 2, soft	23 65 to 24 15
Southern Gray Forge	21 65 to 22 15
Southern Silveries	24 65 to 25 15
Jackson Co. Silveries	28 00 to 29 00
Ohio Strong Softeners	25 60 to 26 10
Alabama Car Wheel	27 15 to 27 65
Malleable Bessemer	25 00 to 26 00

BARS.—The specifications of one Western bar iron mill have been so light in the past two weeks that it has been compelled to shut down part of that time. With but one exception, all the local manufacturers report a scarcity of new business and light specifications. In contrast with this condition, and probably because of the $2 difference in price, the demand for steel bars has been active. Bar iron manufacturers generally report that they are holding to quotations, but on desirable business there are reports of sharp competition. We quote Chicago delivery, mill shipments, Bessemer steel, 1.75c to 1.85c; angles, less than 3x3, 1.85c to 1.95c, base; iron, 1.95c; hoops, 2.15c. Prices out of store, steel, 2c to 2.10c; iron, 2.20c to 2.25c; hoops, 2.40c to 2.50c; angles, 2.50c to 2.60c.

SHEETS.—Reports are current of cutting in prices of light sheets, ranging from $2 to $5 a ton. The market is considerably weaker, and though there is plenty of business being offered, it is not enough to keep all the mills in full operation. The demand for sheets of heavy gauges is greater than the supply, and all the mills are behind on their deliveries. We quote No. 27 Black, mill shipments, Chicago delivery, 3.10c to 3.15c; galvanized, 4.05c to 4.10c; out of store, No. 27 Black, 3.20c to 3.30c; galvanized, 70, 10 and 5 percent and 75 percent.

STRUCTURAL MATERIAL.—Orders for 1,000 to 1,500 tons of structural shapes have been placed during the week with domestic mills and for 300 tons of beams with German mills. Several new buildings of large proportions are being talked of in this city, but as it is now impossible to get material within 15 months, it is questionable if work will ever be commenced on them. We quote mill prices, as follows: Beams, 15 inches

and under, 1.75c; 18 inches and over, 1.85c; structural angles, 3x3 to 6x6, 1.85c; angles, channels and tees smaller than 3 inches, 1.85c, base; plates, 1.75c. Prices on lots for quick delivery or from store, vary from 2¼ cents to 3 cents a pound, according to the size of order and delivery required.

BILLETS.—There have been some small sales of domestic forging billets on the basis of $38 to $40 a ton, depending upon the size of order and delivery.

RAILS AND TRACK SUPPLIES.—Some new inquiries are reported from Western railroads, asking for deliveries on lots from 1,000 to 5,000 tons. A few sales have also been made for shipment late in the year. It is reported that a sale was made several days ago through the St. Louis office of an Eastern mill of 2,500 tons of standard sections at $28 for delivery in October, November and December of this year, this being a lot which was contracted for but not taken by the original buyer. There is an active demand for light rails and relayers, one sale of 2,000 tons of the latter being noted. Track supplies are also brisk, with most of the mills sold up for the balance of the year. We quote heavy sections, $28; second quality, $27; light rails, 45 pounds, $34 to $35; 12 pounds, $40 to $41, with regular differentials for intermediate sizes; light rails, out of store, $45 to $50; track supplies, mill shipments, as follows: Angle bars for standard rails, 1.90c to 2c; spikes, first quality, 2.50c—second quality, 2.25c; track bolts, 3½x¾, with square nuts, 2.85c to 3.00c per 100 pounds; with hexagon nuts, 3.05c to 3.20c, with usual differentials for other sizes.

MERCHANT STEEL.—Some manufacturers who had failed to cover for their winter requirements have placed contracts during the week, and mills have accepted them for such deliveries as they could promise. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c, flat sizes; concave and convex, 2c; out of store, 2.15c; cutter shoe, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c, base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.25c to 2.35c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 percent to 10 percent higher; cold rolled shafting, carload lots, 47 percent off, Chicago; less than carload lots, 42 percent off, Chicago.

MERCHANT PIPE.—Much competition is noted from independent mills and these are reported to be taking business at cut prices. We quote as follows:

MERCHANT PIPE, RANDOM LENGTHS.
(Jobbers, Chicago Basing Discounts.)

	Black Percent.	Galv. Percent.
⅛ to ½ in. inclusive	58½	46½
¾ to 12 in. inclusive	65½	53½
(Consumers, Chicago Basing Discounts.)		
⅛ to ½ in. inclusive	56½	43½
¾ to 12 in. inclusive	63½	50½

BOILER TUBES.

Steel.

	Percent.
1 to 1½ in.	35
1¾ to 2½ in.	45
2¾ to 5 in.	55
6 to 13 in.	47½

Iron.

	Percent.
1 to 1½ in.	35
1¾ to 2½ in.	32½
2¾ to 5 in.	42½

CAST IRON PIPE.—Outside of the usual run of small orders, there is nothing to report. We quote 4-inch water pipe, $37; six-inch and larger, $36; gas pipe $1 a ton higher.

PLATES.—Demand for this material keeps beyond the supply, and mills are getting behind in deliveries. There is an active trade with stores, and prices are slightly higher. We quote mill prices for future shipment, Chicago delivery: Tank steel, ¼-inch and heavier, 1.75c to 2.15c; flange steel, 1.85c to 2.25c; from stock, tank steel, ¼-inch and heavier, 2.25c to 2.30c; 3-16, 2.35c to 2.40c; No. 8, 2.45c to 2.50c; flange steel, 2.35c to 2.40c. We would note that though there has been no change from the mill price of 1.75c, independent manufacturers are asking not less than 2.15c for delivery within three to six months.

WIRE AND WIRE NAILS.—The market is slightly better than it has been, though prices are weak and are being cut by independent manufacturers. We quote as follows: To jobbers, smooth wire, carload lots, $2.10; painted barb wire, $2.75; galvanized barb wire, $3; wire nails, $2.15 staples, $2.25. Jobbers' prices to retailers, five cents higher than above.

COKE.—There is no improvement to be noted in the local situation, and probably none has occurred at any point west of Ohio. Sales of spot coke commands from $12 to $14 a ton. Stocks are practically depleted in the West and many foundries and furnaces are working only part of the time.

OLD MATERIAL.—Buying has been confined very largely to special lots during the week. Cast scrap is in great demand and finds ready buyers when it is offered. Quotations are without change.

Old Iron Rails	$24 50 to 25 00
Old Steel Rails (mixed lengths)	19 00 to 19 50
Old Steel Rails (long lengths)	23 00 to 23 50
Relaying rails	31 00 to 31 50
Old wheels	20 50 to 21 00
Heavy melting steel	17 50 to 18 00
Mixed country steel	15 50 to 16 50

The following are selling prices per net ton:

No. 1 R. R. wrought	$21 00 to 21 50
No. 2 R. R. wrought	19 50 to 20 00
Shafting	20 00 to 21 00
Dealers' forge	17 00 to 18 00
No. 1 busheling	15 50 to 16 00
No. 1 Machine Cast	18 00 to 18 50
Railroad Cast	17 00 to 17 50
Railway malleable	16 50 to 17 00
Country malleable	15 50 to 16 00
Iron axles	24 50 to 25 00
Steel axles	21 00 to 21 50
Cast borings	10 50 to 11 00
Wrought turnings	14 00 to 14 50
Iron axle turnings	15 00 to 15 50
Steel axle turnings	14 50 to 15 00
Stove plates	12 00 to 12 50
Old iron splice bars	21 00 to 21 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Oct. 1.

The features of the Cleveland market this week are continued distress of furnaces on account of coke shortage, anxious waiting of foundrymen for arrival of foreign iron and keen interest in the sheet situation.

IRON ORE.—Although there has been considerable delay in unloading vessels during the past month, it is believed that the total shipments from upper lake ports for September will not be far below those for August, which were 4,078,311 tons. A total shipment of 3,105,992 tons in September would make the total to Oct. 1 equal to that of the entnre season in 1901, and there is no doubt that the season's record of last year has already been passed. It is estimated that about all the ore in stock piles at mines and northern ports will be exhausted by Oct. 15. Although grain is now moving freely, there has been no scarcity of boats for either grain or ore. The coke shortage having forced many furnaces to bank from time to time, ore is piling up at these furnaces, and some owners have asked that shipments of ore to the furnaces be stopped and, if possible, space for the ore be obtained on docks. It seems certain that unless the fuel situation is soon greatly improved, there will be a demand for much more dock space than will be available. There are now almost no sales of ore.

PIG IRON.—The first order for foreign iron was placed in Cleveland Sept. 8 and numerous small sales have since been made, but none has been delivered. Foundrymen who have much trouble in getting enough iron to keep their plants running are anxiously awaiting the arrival of the foreign iron, while sellers are equally interested, as future sales will depend largely upon the results of experiments to be made with the foreign product. It is confidently expected that some tests will be made before the end of next week. The trouble of the foundrymen who have inadequate supplies have not decreased. Borrowing a few tons here and a few tons there is now common, but there are few who have any iron to spare for even a limited time. So far as Cleveland interests are concerned, the coke situation is not improved. The furnaces at Struthers and Lowellville have been compelled once more to bank. The Struthers furnace was operated only 20 days during September. The disastrous effect which frequent banking is having on furnaces is shown in the case of the Mabel furnace at Sharpsburg, Pa., which has blown out for at least a week for repairs. Very little domestic iron was sold in Cleveland during the week. Prices were stationary and we quote as follows, the figures on foundry iron being for shipment in the first half of 1903:

Bessemer	$22 25 to 22 75
No. 1 Strong Foundry	23 00 to 23 50
No. 2 Strong Foundry	22 50 to 23 00
No. 3 Foundry	21 75 to 22 25
Scotch No. 1	23 00 to 23 50
Scotch No. 2	22 50 to 23 00
Gray forge, Valley	20 50 to 20 75
Lake Superior Charcoal	25 00 to 26 00

FINISHED MATERIAL.—After the large sales for new vessels and other interests reported last week, there has been comparative quiet in the market. The most interesting feature is found in sheets. For some time the smaller mills have been cutting prices and showing great energy in going after business. Their success in obtaining orders has clearly indicated that the principal producers would not allow such conditions to prevail for an indefinite period and it has been frequently intimated in these columns that a decline in prices might be expected. Reports from Central Western points indicate that recent cuts in price amount to from $3 to $5 a ton on lighter guages. While Cleveland jobbers have not yet changed their prices, a revision is bound to come and the quotations below on No. 18 and lighter may be considered nominal. We quote 2.10c to 2.15c, Cleveland, for 3-16-inch sheets and heavier. Cleveland prices on mill sales of black sheets are on the following basis: No. 24, 2.90c to 3c; No. 26, 3c to 3.10c; No. 27, 3.10c to 3.20c; and the following prices out of stock: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.55c to 2.70c; No. 16, 2.95c to 3c; No. 18, 3c to 3.15c; No. 20, 3.05c to 3.20c; Nos. 22-24, 3.15c to 3.30c; Nos. 22-26, 3.25c to 3.40c; No. 27, 3.35c to 3.50c; No. 28, 3.45c to 3.60c, for one pass cold rolled. On galvanized sheets Cleveland prices to consumers are as follows for carload lots: Nos. 10 and 11, 3.15c; Nos. 12 to 14, 3.25c; Nos. 18 to 21, 3.55c; Nos. 22 to 24, 3.85c; No. 27, 4.53c; No. 28, 4.60c.

The indications are that the slackness in tin plate and to some extent in other lines will not affect the billet situation, and domestic steel is being quoted at $31, though some foreign steel has been offered at $28 to $28.25, Cleveland. Rather more Bessemer steel is going into structural material, light rails, angles, etc. Better delivery in angles than has been possible for some time is now assured, as a number of mills which have not been turning out angles will hereafter do so. Possibly the recent importation of angles by the American Shipbuilding Co. has contributed to this change of policy. The week has been quiet in plates. The pool price for tank steel is 1.70c, Cleveland, but from 2c to 2.15c is paid for prompt delivery. The base price for bar iron, 1.80c, Pittsburg, is still maintained and early delivery is given on small sizes. There has been a slight shading recently on certain extras. Sales out of store, Cleveland, are at the rate of 2c for iron and 1.90c to 2c for steel, while large rounds bring from 2.10c to 2.25c. We quote steel bars at 1.60c for Bessemer and 1.70 for open-hearth, Pittsburg.

OLD MATERIAL.—There has been a strong demand for wrought scrap, axle turnings, wrought turnings, and wrought drillings and prices have advanced from 50 cents to $1 per ton on those kinds of old material. Heavy steel has also advanced. We quote Cleveland prices, all gross tons, as follows:

Old iron rails	$25 50 to 26 50
Old steel rails (over 6 ft.)	22 00 to 23 00
Old steel rails (6 ft. and under)	21 00 to 22 00
Old car wheels	20 00 to 21 00
No. 1 R. R. wrought scrap	23 50 to 24 00
Mill scrap	19 50 to 20 50
No. 1 machine cast scrap	20 00 to 21 00
Iron axles	29 00 to 30 00
Steel axles	28 00 to 29 00
Axle turnings	18 50 to 19 50
Wrought turnings (free from cast)	17 00 to 18 00
Cast borings	11 00 to 11 50
Uncut wrought iron boilers	12 00 to 13 00
Steel boiler plates	17 00 to 18 00
Grate bars	12 00 to 13 00
Pipes and flues (clean)	17 50 to 18 50
Tank iron	17 00 to 18 00
Hoop and band iron	13 50 to 14 50
Sheet iron	11 50 to 12 00
Wrought drillings	16 00 to 17 00
Malleable iron (railroad)	20 00 to 20 50
Malleable iron (agricultural)	17 50 to 18 00
Stove plate	13 00 to 14 00
Heavy steel	19 00 to 20 00

The Struthers Furnace Co., Cleveland, announces the removal of its offices on October 15, to rooms 1106-1109 Citizen's Bank building, No. 190 Euclid Ave.

CINCINNATI.

Sept. 30.

The situation in the iron trade has not changed materially during the week. If there has been any change, the troubles of the trade are more aggravating. The coke supply is again the note of complaint which comes from all along the line. Two furnaces at Ironton, O., have been forced to bank this week. Their combined capacity was 350 tons a day. These seems to be no let up in the advance on coke, and good foundry coke for spot delivery is bringing fancy figures. Some improvement in transportation in the Connellsville district is to be noted, but supplies from the Virginias have not been enlarged and conditions in the Pocahontas and New River districts are said to be exceedingly bad. Meantime the consumption of iron continues on an enormous scale and the reserve stocks which large consumers have tried to keep on hand for emergencies are being depleted. As the consumers see these stocks running out they renew their urgent calls for deliveries. The importations of foreign iron have afforded partial relief, being all that kept some plants at work. Quite a tonnage of Scotch and German irons has been booked during the week. There is very little domestic iron now offered for delivery this year, and that little is held at strong prices.

Prices for pig iron have remained unchanged. In finished material there is a good demand for all descriptions. Old material is still firm but not essentially changed in value.

PIG IRON.—The volume of business has not been large the past week. Sales are still for delivery in the first half of 1903. A few transactions have been made for delivery in the second half of next year but as a rule furnaces are not quoting beyond July. The lower grades are still a little heavy on the market. A sale of 400 tons No. 4 foundry spot on the basis of $18, Birmingham, is reported. Virginia irons are selling to a moderate extent at $19.50 to $20 at the furnace for No. 2 first half of 1903. Some Virginia furnaces are advancing prices and some are considering withdrawing from the market entirely, not caring to sell any more iron under the present uncertainty of coke supply. Virginia coke is selling for next year's delivery at $4.50 at the ovens. Offerings of iron are not large even for the deferred deliveries. There has been some activity in charcoal irons both Northern and Southern. Choice Hanging Rock cold blast has sold at $36 cash furnace and Southern car wheel at $25 cash furnace. Prices f. o. b. Cincinnati for delivery after January 1, are as follows:

Southern Foundry No. 1	$23 75 to 24 25
Southern Foundry No. 2	23 75 to 23 25
Southern Foundry No. 3	22 25 to 22 75
Southern Foundry No. 4	20 75 to 21 50
Southern Foundry No. 1, soft	23 75 to 24 25
Southern Foundry No. 2, soft	22 75 to 23 25
Gray Forge	20 00 to 21 00
Northern Foundry No. 1	26 10 to 26 60
Northern Foundry No. 2	25 10 to 26 10
Southern car wheel iron	28 00 to 29 00
Malleable coke iron	25 00 to 25 75

FINISHED MATERIAL.—The demand continues good for all descriptions. The market for sheets shows increased demand at the concessions recently made. The most pronounced inquiry is for plates and structural iron. A sale of eight cars of structural iron went forward out of stocks here this week to a point in Indiana. This was all of the required sizes that could be had here. The specifications covered a much larger quantity. The nearest deliveries obtainable on plates is about four months ahead and some mills make six months the nearest time for which they can make contracts. Stocks of all kinds of material are light. The demand for wrought pipe and boiler tubes is comparatively light and the market is a trifle unsettled but not quotably changed. Prices for bar iron in carload lots are: 1.92c base, half extras f. o. b. Cincinnati; steel bars, 1.72c base, half extras f. o. b. Cincinnati. Both are retailed at 2.20c base, full extras, out of store. Beams are selling at 3c retail and angles and channels at 2.40c for base sizes. Black sheets are on a basis of 2.35c for No. 10 and $2.50 for No. 12, with $1 per hundred advance for galvanizing. We quote tank plates on a basis of 2.10c to 2.25c f. o. b. Cincinnati for ¼-inch and heavier. Wrought pipe and boiler tubes are quotable as follows for carload lots f. o. b. Cincinnati:

WROUGHT PIPE.

(Basing Discounts.)

	Black Percent.	Galv. Percent.
⅛ to ⅜ in. inclusive	58.8 & 7½	46.8 & 7½
¼ to 12 in. inclusive	65.8 & 7½	53.8 & 7½

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ in.	43.8 & 2½	41.3 & 2½
1¼ to 2½ in.	56.3 & 2½	38.8 & 2½
2¼ to 5 in.	61.3 & 2½	46.8 & 2½
6 to 13 in.	56.3 & 2½	38.8 & 2½

OLD MATERIAL.—The market rules firm with a continued

good demand. Old iron car wheels are a shade higher, but prices are otherwise unchanged. We quote:

Old No. 1 Wrought Railroad, net tons	$21 00
Cast Machine and Foundry, net tons	$17 00 to 17 25
Old Iron Rails, gross tons	25 00 to 26 00
Old Steel Rails, gross tons	24 50 to 25 00
Old Short Lengths, gross tons	18 00 to 18 50
Old Iron Axles, net tons	28 00 to 28 50
Old Iron Car Wheels, gross tons	21 25 to 21 50
Stove Plate, net tons	11 75 to 12 00
Wrought Turnings, net tons	16 00
Cast Borings, net tons	11 00

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, No. 150 NASSAU ST., Sept. 30.

PIG IRON.—If any change can be noted, it is in the serious plight in which foundrymen find themselves, in consequence of their inability to procure fuel. This has been accentuated in this locality during the past week, and it would not be at all surprising to hear of many foundries closing down entirely. The famine conditions prevailing in coke have been responsible for a letting up in the demand for foreign iron. Sales agents here tell of consumers who were on the verge of closing contracts with them, deciding not to do so, because of doubts about obtaining fuel with which to melt the iron. As a result the "keen edge" has been taken off the market for foreign irons. Withal there is a good business doing, with the West more largely represented in the purchases than any other section. Prices continue about the same as those which have formed the basis of trades for several weeks past. Middlesboro No. 1 is selling at from $21.50 to $22, New York delivery, although one concern is quoting it at $22.90 for delivery at seaboard ports. Middlesboro No. 3 sells for $21, New York, ex-ship, and some good sized quantities can be purchased at this figure, although one hears of higher prices. Scotch brands are selling all the way from $21.25 to $25, according to grade. A noteworthy feature of the trading in foreign irons is the increasing tendency to purchase on analyses, rather than on grade or brand. This has obtained so largely that one firm of sales agents here, representing many large foreign interests, has prepared a schedule of analyses of foreign irons they sell, and they always answer inquiries by sending this schedule, so that if the prospective purchaser is satisfied he is likely to get iron of either English, Scotch, German, or French make. Their schedule is as follows:

GUARANTEED ANALYSIS.

	Silicon	Sulphur	Phosphorus	Manganese
		Foundry.		
Series A.	3.00 to 3.50	under .05	.60 to .80	.40 to .80
Series B.	2.25 to 2.75	under .04	.50 to .90	under .80
Series C.	1.25 to 1.60	under .05	.50 to .70	.50 to .80
		Malleable.		
Series D.	.75 to 1.25	under .04	under .20	over .50
		Bessemer.		
Series E.	1.25 to 2.50	under .05	under .08	
Series F.	2.50 to 3.00	under .05	under .10	
Series G.	2.50 to 3.50	under .05	under .06	.40 to .80
Series H.	1.00 to 3.00	under .05	under .10	
Series I.	1.00 to 3.00	under .035	under .035	
Series J.	1.00 to 3.00	under .030	under .030	

In domestic irons there is nothing of special interest to be noted, except that the greatest dissatisfaction prevails regarding belated deliveries. A large Eastern consumer who has 15,000 tons under contract for immediate delivery with three large producers, found it compulsory to go out in the market and purchase several hundred tons in order to keep his plant going to meet an urgent order. The price was largely in excess of that governing the contracts mentioned. Sales of domestic iron for near delivery are being made in small carload lots at $25.25 for delivery in this harbor, while reports from Birmingham state that Southern foundry No. 2 is selling for spot delivery all the way from $24 to $25 at the furnace. Advices from Birmingham are that little or no business is being done in next year's irons, and when a sale of No. 2 Southern foundry is made, it is very near or at $20 at furnace. Northern furnaces are booking some orders for next year, but in limited quantities, and at prices averaging from $21 to $23 at the furnace. Nothing is heard about foreign irons for delivery next year beyond the fact that the furnaces don't care to book any business, particularly at this time, because they do not know what freight rates the officials of the new steamship merger will impose. New York prices for this year, mostly nominal, are as follows: No. 1 X Northern, $23.50 to $25; No. 2 X Northern, $22.75 to $23.50; No. 2 plain, Northern, $22.25 to $22.50; No. 1 foundry, Southern, $22 to $23; No. 2 foundry, Southern, $21.75 to $22.50; No. 3 foundry, Southern, $21.25 to $22.75; No. 4 foundry, Southern, $20.75 to $21.25.

FINISHED IRON AND STEEL.—Activity still continues, with spot material scarce and commanding good premiums wherever obtainable. Buying for next year delivery is assuming great proportions, and it is said that several of the mills have taken such a large number of contracts for heavy material that their deliveries will extend into 1904. Plates are extremely active. Sheets continue to be the weak spot in the finished material market. Concessions fail to produce trade of any account. There are rumors that black and galvanized sheets lighter than No. 18 have been reduced about $5 per ton in consequence of the cut in prices independent mills are making. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.95c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 2.10c to 2.15c; flange, 2.25c to 2.30c; fire box, 2.30c to 3.50c; refined iron bars, 1.95c to 2c; soft steel bars, 1.95c to 2.10c; steel sheets, in carloads, New York; No. 28, black, 3.18c to 3.25c; No. 28, galvanized, 70, 10 and 5 off.

PHILADELPHIA.

Sept. 30.

Owing to the extreme uncertainty concerning future supplies of coal and coke, buying is not as vigorous as it would be if furnaces and factories were assured that fuel supplies would be adequate. Unless shipments of coal and coke are largely increased, many manufacturing establishments will be compelled to close. Cost of production, owing to increased prices for fuel, has upset calculations. Settlement of the great strike will surely be followed by most unsatisfactory conditions of freight, as the railroads will not be able to handle the many millions of tons of coal demanded. It is not easy to take an optimistic view of the situation.

PIG IRON.—Foreign iron is about the only kind in the market. It is estimated that the imports for September will be more than 100,000 tons, and it is believed they will be larger for October. European agents are pushing for orders. Nominal quotations for American iron are, for this year, $23 to $24 for No. 2 X foundry, $22 to $22.50 for No. 2 plain, $20 to $20.75 for grey forge and $21.50 to $22 for basic. Foreign irons, at vessel, duty paid, are as follows: Scotch No. 1 foundry, $22.50 to $23; Scotch No. 2 foundry, $21.50 to $22; Middlesboro, $20.50 to $21.

BILLETS.—The demand for billets is not so strong. The price is now $27.50 to $28 for foreign steel and $32 to $32.50 for American.

FINISHED MATERIAL.—Sheets are erratic and one of the big sheet companies is said to have made a cut of $5 per ton on No. 18 and lighter. Bars are in good demand and fairly prompt delivery is given. Plates are active and much higher prices are paid than are quoted by the leading producers. The ruling price for tank steel is from 2.05c to 2.10c; angles are 2.25c to 2.50c; bar iron, 1.92c to 1.95c; steel bars, 2c to 2.10c; beams and channels, 2.10c to 2.25c for early delivery.

OLD MATERIAL.—Old material is in fair demand, but foreign scrap is coming in and will have some effect in checking advances. We quote as follows: Old steel rails, $21.50 to $22; miscellaneous heavy steel scrap, $20.75 to $21.25; low phosphorus scrap, $27.50 to $28.25; old steel axles, $26.50 to $27.50; old iron axles, $30 to $31; old iron rails, $24 to $25; old car wheels, $19.75 to $20.50; choice scrap railroad No. 1 wrought, $24.50 to $25.50; country scrap, $21 to $22; machinery cast, $19 to $20; No. 2 light scrap, forge, $17 to $18; No. 2 light scrap, ordinary, $15 to $16; wrought turnings, $16 to $17; cast borings, $10 to $10.25.

During the first half of the current year the exports of iron and steel from Germany to the United States were 75,748 tons, compared with only 3,947 tons for the corresponding period last year. Only a few years ago Germany's imports of iron and steel from all countries largely exceeded the exports, while the indications for the present year are that exports will exceed the imports by more than 2,500,000 tons.—[Bulletin.

LAKE SUPERIOR IRON MINES.

At the Hartford mine, Negaunee, a large amount of new machinery is expected soon and the mine buildings are about completed. The mine should be a large producer in a couple of years. It will be a deep proposition, and contains, it is understood a considerable body of very good ore.

The Helen mine of the Clergue Syndicate is not shipping as heavily as early in the year, in part because of the change in mining methods long required and commenced upon this season. All the mining heretofore done was in an open pit on the side of the lake, and the property was not well located for the work. It was decided by Mr. E. F. Bradt, who became general superintendent of mines for the Algoma Commercial Co. last winter, to make the change to milling and this is now being done. A shaft has been sunk and a second one started. Ore will be milled to raises and hoisted through the shaft to the crusher. The work of shaft sinking has been delayed and the product that was expected for the year can scarcely be made, it is reported from the mine.

There is little to report of progress in the shaft being driven to the ledge by the Cleveland-Cliffs Iron Co. at the Mass property in Negaunee. The facts are that this shaft is not coming along very well and is disappointing to its projectors. There will be no abandonment of the project in any event, but possibly some other method of sinking may be adopted. Though a year has been occupied in getting this shaft down no great amount of money has been expended and the management has progressed in the cautious way the situation was seen from the beginning to demand. It was never considered a sure thing that the shaft would ledge.

All the eight steam shovels of Marion make that have been contracted for by the Minnesota Iron Co. (U. S. Steel) will be used at mines in Minnesota. Some will be at open pit mines of the Mesabi range, some will be used for stockpile loading on that range and some for the same duty on the Vermillion.

It is expected in some circles that freight rates on iron ore will be higher another year than now, the prediction being made that an advance of about 10 cents in the rate for season charters would be accepted by the Pittsburg Steamship Co. As this company is the largest taker of tonnage in the market what it may figure as the proper price will have great weight. It is well known that the increase of carrying capacity will be considerable. Expectations of a higher rate must be based on an increase in ore shipments or a short season, or both.

Two very rapid jobs of ship loading are to be added to the long list of quick handlings on the lakes. The Jas. H. Hoyt took on a cargo of ore last week, consisting of 5,200 tons, in 90 minutes, of which time 28 minutes were spent in shifting from chutes to chutes of the ore docks. This is practically 5,000 tons an hour. The steamer Sultana arrived inside Duluth harbor entrance at 1:30 p. m., and cleared from the elevators at 6 the same afternoon with 200,000 bushels of wheat on board.

At the Shenango mine of the Oliver-Snyder interest, which is being operated under contract by the Minnesota Iron Co., they have commenced a new shaft, midway between Nos. 1 and 2. No. 1 is abandoned on account of quicksand and No. 2 has had considerable trouble from the same source. An order has just been placed with the Prescott company for a very large pump. The mine will ship no ore this year, as was originally intended, on account of the vexatious delays encountered in its opening. It should make shipment of at least 100,000 tons in 1903. There are some 7,000,000 tons of ore, perhaps more, in this mine, and of a very fine grade, both chemically and physically.

Fayal has increased shipments the past few days and is putting out about 10,000 tons a day. It will make the expected total for the year. The open pit west of No. 2 shaft, which is operated by the milling system, is to be enlarged and extended under a very heavy stripping. A very large amount of lean silicious ore has been handled at this mine this year, from the large stripped pit at No. 3 shaft, some of which has been mixed and shipped and some of which has been put aside for whatever the future may show it to be worth.

The Wills mine, now being opened by officials of the Republic Iron & Steel Co., is expected to ship about 10,000 tons this year and will be prepared for a considerable movement another season. Tracks are now being put into the property by the Duluth & Iron Range Road. This is the sixth mine to ship from the vicinity of the village of McKinley, all being small properties except the Elba and Corsica.

Stephens mine is still undergoing preliminary stripping and opening. It will perhaps ship a cargo or two this year, but no more. The stripping work has been increased and three engines are now employed thereat. Another year and this mine will make a great producer. All the work that has been done is of the most permanent character and with the idea of a great business later.

Penobscot mine will not make the output that was hoped for early in the year, and it is not probable that more than 250,000 tons will be produced. This mine is pumping about the same quantity of water as in the past.

A considerable body of ore has recently been explored in section 11, T 58 R 18, but it is to be held for the future by its owners, who have every confidence in the future of comparatively low grade bodies of non-Bessemer ore.

The Oliver Iron Mining Co. has started two diamond drills in the land under option to it just west of the McComber mine on the Vermillion range. The McComber is said to be drilled in one hole to the depth of not far from 500 feet. Drills are going into the middle of T 62 R 11 lying northeast of section 30 and several will be put at work on the strike of the ore bearing formation through that township. A drill is at work northeast of the Savoy mine, at Ely, and a drill is at work north of the Pioneer mine, but so far without result.

The Great Northern road will add 17 miles of double track to its ore line, giving it a double track from the point of junction of its two ore roads and its docks. It will also add another ore dock to the present equipment. The road is continually exploring lands on the Mesabi and is finding some ore, though its efforts are not now rewarded with former success. The story that the road would build to the Vermillion range and is now taking options on lands there is without foundation.

Corrigan, McKinney & Co. have decided to reopen the Commodore mine. The first ore taken out of this mine was 65,137 tons in 1893, but in the following year only 7,213 tons were mined and none in 1895. The largest output was 278,416 tons in 1900. Last year 35,546 tons were mined.

A Third Sharon Steel Co. Furnace.

The Sharon Steel Co. has authorized the erection of another blast furnace which will have a daily capacity of 400 tons. It will be a duplicate of the 400-ton furnace now under erection at the company's plant, Sharon, Pa. The contract for three pairs of blowing engines was awarded to McIntosh-Hemphill & Co., of Pittsburg, and will have a capacity of 2,000-h. p. each. The contract for the erection of the furnace was awarded to the Pennsylvania Engineering Works, of New Castle, Pa., while the Brown Hoisting Machinery Co., of Cleveland, was awarded the contract for erecting the ore handling machinery. The company also recently purchased the right to use the Monell process in its open-hearth department.

The Johnson Lumber Co., Milwaukee, Wis., is doing a large business in the machinery and manufacturing trade in general. The company makes a specialty of cork pine pattern lumber, but handles all other grades of white pine, such as boxing, template, crating and flask stock. Shipments are made direct from the mill in Northern Wisconsin and the company guarantees good even grades, with prompt shipment, and will make up a straight or mixed car of anything in the line of white pine lumber, furnishing a customer an assortment of stock to meet his requirements. The company furnishes timber for loading and shipping heavy machinery and can supply heavy fir timbers from the Pacific Coast for construction work.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, No. 150 NASSAU ST., Sept. 30.

PIG TIN.—The market for pig tin during the past week was almost entirely marked by weakness, and low prices prevailed. Trading was largely of the speculative character, and was chiefly confined to futures, which ruled strong. There is very little demand for spot, and as a result it is weak both here and in London. On all sides definite news as to the probable shipments from the Straits is awaited with great interest. If they are large, and opinion is pretty strong that they will be, a decline in prices is anticipated, as consumption in this country has shown a retrograde tendency recently. The importations for the month up to date at Atlantic ports amount to 3,452 tons. New York prices are as follows: Spot, 25.75c to 25.90c; October, 25.50c to 25.75c; November, 25.25c to 25.50c; December, 25.15c to 25.35c.

COPPER.—Dullness has been the prevailing characteristic in copper during the week. Demand is at a low ebb, but withal there is no tendency to sell. Local consumption has been limited, and with stocks accumulating no improvement in prices has taken place, nor is any expected. Similar conditions prevail in London. Exports for the month so far aggregate 10,752 tons, while imports are about 5,000 tons. Official statistics just published for August show an accumulation in spot stocks for that month of 5,821 tons, while the net exports for the same month amounted to 4,475 tons. Prices for large lots, spot to December delivery, are as follows: Lake, 11.55c to 11.75c; electrolytic, 11.35c to 11.55c; casting, 11.35c to 11.50c; standard, 10.75c to 11c.

PIG LEAD.—Prices are unchanged. The market has been fairly active, and sales have been on the basis of 4.12½c for lots of 50 tons or more. Both St. Louis and London markets have been firm. Futures are strong.

SPELTER.—A scarcity of material has been the dominant feature of the market, with spot commanding 5.50c on limited sales The St. Louis market has been strong, but in London a slight weakness has been noted. Futures are firm.

ANTIMONY.—With limited transactions, Cookson's has been selling at 10c, Hallett's for 7¾c, and other brands for 7½c.

NICKEL.—Most of the material now being used was contracted for some time ago, hence there is very little trading now. Normal prices are at 40c to 60c, according to quantity.

QUICKSILVER.—The market continues firm under a fair demand, with sales at $48 per flask in 100-flask lots. London is quoted at £8 15s.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK, Sept. 30.

Copper continues to be weak, and pig tin also has declined in value. There is little demand for either metal. Spelter maintains its past firmness due to a scarcity of ore. We quote jobbers' prices to consumers, as follows: Lake copper, carload lots, 12¼c; less than carloads, 12½c to 12¾c. Pig tin, 27½c; Pig lead, carload lots, 4.10c; less than carload lots, 4½c. Sheet zinc, carload lots, 6½c, and 6.65c in lots of 600 pounds. Spelter, carload lots, 5.85c; less than carload lots, 5¾c to 6c. Antimony, 10¾c to 11c for Cookson's and 9¾ for Hallett's in small quantities. Nickel, 55c to 65c, according to size of order and delivery. Inquiry for old metals is good and prices are firm. Selling prices of dealers are as follows: Copper wire, $10.50; heavy copper, $10.50; light copper, $9.50; red brass, $10.75; yellow brass, $8.25; light brass, $6.75; lead pipe, $3.90; zinc, $3.75.

A card device, for displaying the colors of Dixon's silica-graphite paint in such a manner as will permit of an exact idea of each color, is being issued by the Joseph Dixon Crucible Co., Jersey City, N. J. The color chart carries with it suggestions as to the class of construction that can be protected with the paint, also instructions as to best methods of applying protective paint.

Robert C. Schenck, president of the Dayton Malleable Iron Co., Dayton, O., has been seriously ill at a resort in the Adirondacks the past week, an operation being necessary.

EASTERN PENNSYLVANIA.

HARRISBURG, Pa., Oct. 1, 1902.—There are over a dozen furnaces in the central part of the State banked because of the coal strike and inability to procure fuel, and more will stop soon. Several of the best-known furnaces are running intermittently, whenever they can get coke. Many have lost time and money because of the conditions and sellers of foreign iron have been busy, as almost all of the small foundries and some of the larger works have been stocking up or buying for immediate use the Scotch and English irons. The prices are considerably below current rates.

In this county the stacks of the Pennsylvania Steel Co. have been compelled to bank several times within the last two or three weeks because of the scarcity of coke and one night the whole group of five furnaces was in danger of banking. The Pennsylvania company's works are very busy and the last roll showed about 8,000 men at work at Steelton. Large shipments are being made by the Pennsylvania and the Central Iron & Steel companies, the latter being engaged on large contracts for steel plate for the government's navy yards.

The Harrisburg Foundry & Machine Works have shipped several large engines to New York City for the new Hotel St. Regis. The engines will run the generators for the electric plant.

The National Brass & Iron Co., of Reading, is erecting an addition 70 by 30 feet. The company has decided to increase its capital stock.

The E. & G. Brooke Iron Co. will start its Birdsboro stacks and the Empire Steel & Iron Co. will put its Macungie, Reading and Topton furnaces into blast at an early date, if the coal strike ends. They are good producers and work on anthracite. Their proximity to the hard coal region will aid them in getting started when coal is at hand.

The Susquehanna Iron & Steel Co.'s furnace at Wrightsville, York county, has stopped because of insufficient coke.

The Emaus furnace of the Reading Iron Co. has been banked.

The situation in and about Lebanon is about as follows: Lebanon furnaces of the Pennsylvania Steel Co., Lebanon Valley furnace, and Nos. 1 and 2 Colebrook running with occasional stoppages for fuel. Sheridan furnaces are idle and there is small prospect of starting for some time if present conditions continue. North Cornwall is being relined and No. 1 Bird Coleman will be started when coke is available and repairs have been completed. No. 2 is in blast.

The Thomas Iron Co.'s Alburtis furnaces are banked owing to fuel conditions.

Coke is selling at from $9 to $10 per ton in this city, York, Lebanon and Reading, but few sales have been made at that figure, which is the highest ever known hereabouts.

The Reading Iron Co. shipped the largest amount of pipe ever known for a week's product from its Reading mills last week.

The Geiser Mfg. Co., of Waynesboro, is selling a number of engines to foreign companies, having recently shipped a large traction engine to Australia. The works in that town are making large contracts for ice machines. A. B. H., JR.

The Steel Corporation's Policy on Raw Materials.

With regard to the reports that the management of the United States Steel Corporation had decided not to sell its raw materials, iron ore and coke to outside interests in the future, ex-Judge E. H. Gary said: "The policy referred to has not been determined nor even considered by the management of the United States Steel Corporation. There is no truth in the report whatever."

The Russel Wheel & Foundry Co., of Detroit, has the contract for the iron work in connection with the rehabilitation of the Peninsular and Detroit charcoal furnaces at Detroit. The same company has the plate work and other iron construction for the new furnace of the Detroit Iron & Steel Co. at Delray, Mich.

The Inland Steel Co., of Chicago, will begin this week to roll beams, channels and angles at its open-hearth plant at Indiana Harbor, Ind.

New Foundry of the William Tod Co., Youngstown, O.

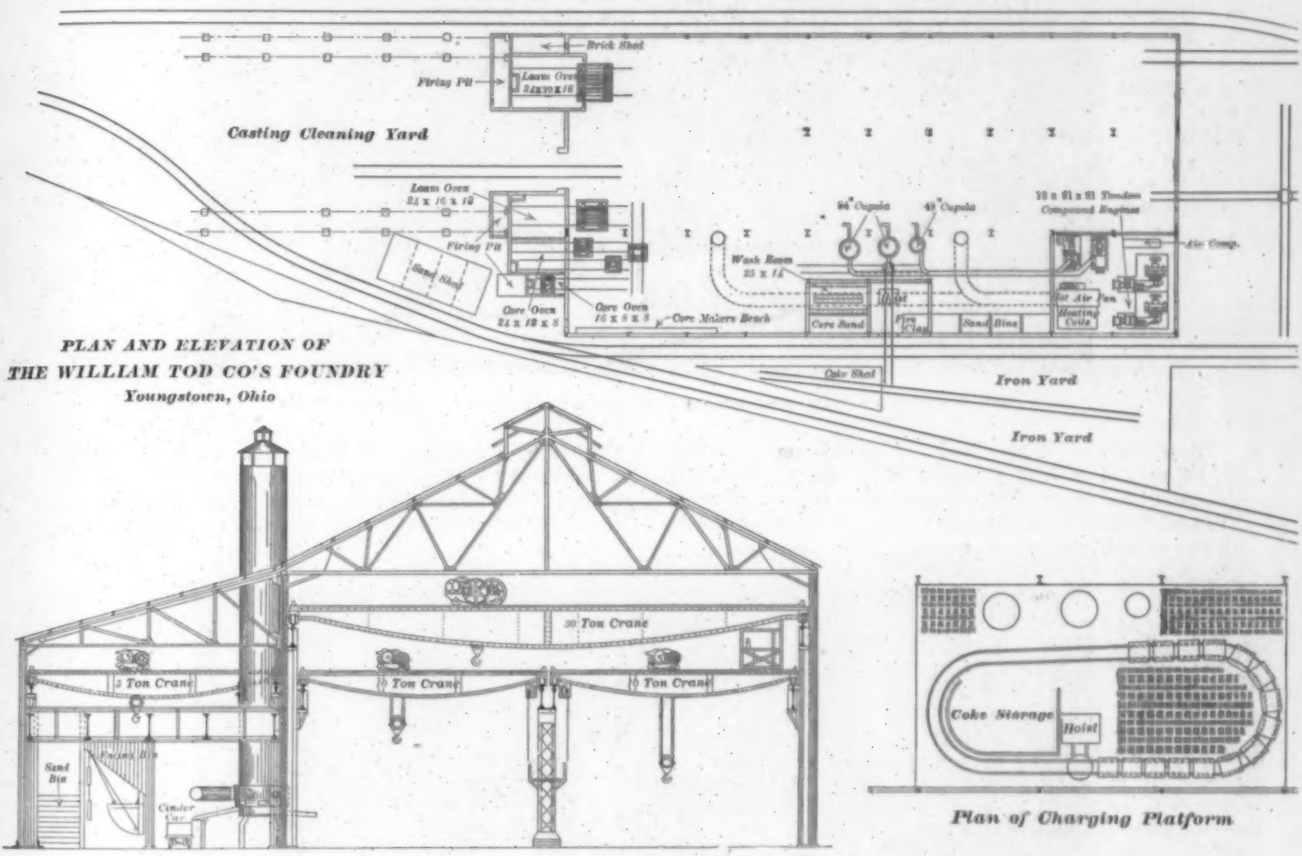
One of the pioneer foundries in the Mahoning Valley is the one operated by the William Tod Co., at Youngstown, O. The plant was established in 1856 by Homer Hamilton, and during the first years of its operation did a general foundry and machine shop business, gradually drifting into the engine trade. Mr. Hamilton and Charles T. Porter designed the well known "Porter-Hamilton" engine which, largely on account of its rigid bed and frame, has been very well received by iron and steel manufacturers, and has done much to contribute to the reputation of the William Tod Co. as builders of high grade rolling mill engines.

The company, operated from 1878 to 1901 by William Tod & Co., a partnership, was incorporated in 1901 as the William Tod Co. The officers are: President, William Tod; vice president, John Stambaugh, Jr.; secretary and treasurer, Paul Jones. The manager is M. A. Neeland. The above named with Henry H. Stambaugh constitute the board of directors.

With increased business the demand upon the company's foundry became much greater than its capacity, and construction of the present shop was begun a little over a year ago. The first column of the crane runway extension was raised on July 6, and on August 14 the first half of the building was completed and the first cast was made in the new shop. The other half of the building was erected on the site of the old foundry. During the whole of the new construction the foundry was kept in operation without the loss of a single day.

The plan and elevation of the foundry give a general idea of the way in which it is laid out and equipped. The main building is 85 feet wide by 250 feet long, with a 40 feet lean-to, in which are located the core department, cupolas, sand bins, wash room, cupola hoist, heating apparatus, air compressors and general power plant. The core department is served by a 5-ton electric crane having a span of 40 feet, the cores being transferred as they are needed to the main shop by means of a transfer car. The core ovens as well as the ovens used for the drying of loam molds and cores are located outside of the building proper, though easily reached by the cranes. There are two ovens for drying loam molds, 24x16x12 feet high and 24x30x16 feet high respectively. The two core ovens are 24x12x8 feet high and 16x8x8 feet high.

The main part of the foundry is served by two 30-ton cranes of 80 feet span, commanding the whole of the shop and the runway which extends for 150 feet beyond the building and covers the yard for cleaning castings, and the space utilized for the storing of loam plates, large flasks and castings. There are also two 10-ton cranes of 40 feet span which command about one-half of the floor space of the foundry. As the illustrations show the large cranes are mounted so that they can travel over the 10-ton cranes, and may be used for any especially heavy work in this end of the shop, although the idea is that the 10-ton cranes will ordinarily be able to serve this part of the foundry. The elevated platform to be seen on the central



PLAN AND ELEVATION OF THE WILLIAM TOD CO'S FOUNDRY
Youngstown, Ohio

Plan of Charging Platform

row of columns supporting the smaller cranes, is for the use of the operator of the small cranes, which are not furnished with a cab as are the larger cranes. The castings turned out in this end of the foundry are such as do not require the constant operation of the cranes, and as a general rule one operator takes care of both.

In order that the 30-ton cranes may travel out on to the 150 feet extension of the runway covering the yard space, this end of the foundry is provided with a swinging door, 15 feet high and 80 feet wide, the movements of which are controlled by an electric motor. One of our illustrations gives a view of this part of the works when the cranes are used outside of the building. At the time this photograph was taken the runway had not been completed to its full length, and it now extends a considerable distance beyond the columns shown.

One corner of the foundry is taken up by the engine room which contains one No. 6 and one No. 7 Baker blower direct connected. Power for driving the tools in the machine shop is also generated in this department, and a compressor furnishes air for the foundry, cleaning yard

and machine shop. The foundry is heated by the indirect method, using exhaust steam in heating coils, distributing the heat by means of a 10-foot fan and underground brick ducts leading to two risers, thus doing away with all overhead piping.

cupola as required, thus doing away with any rehandling and reducing the labor to a minimum. There is also stored upon the platform a supply of pig iron and coke to be used in case of failure of the hoist or other apparatus.

The iron yard is just outside of the foundry, and is

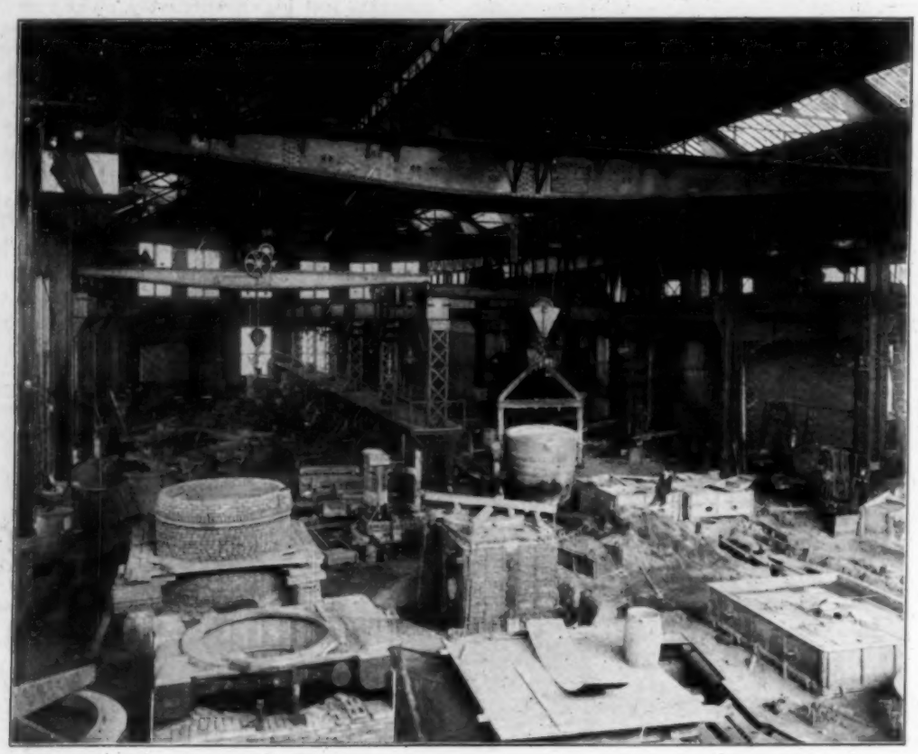


FIG. 2.—INTERIOR VIEW, NEW FOUNDRY OF THE WILLIAM TOD CO., YOUNGSTOWN, O.

There are two 84-inch and one 48-inch cupolas, lined to 66, 60 and 40 inches respectively, supplied from one common blast main. The charging floor is reached by an electric hoist of 5-ton capacity and is arranged as shown in the general plan of the foundry, lower right hand corner. On the charging platform is a continuous track, 36-inch gauge, on which is a train of loaded charging cars. These cars are taken up from the iron yard during the forenoon and in the afternoon the entire charge is stored upon the platform on wheels, and is rolled in front of the

reached by a narrow gauge track. On this track there is a combined transfer and scale car, the scale car being arranged with furnace charging beams and carrying the small cupola charging car on its platform upon rails at right angles to its track. The proper mixture is made up

FIG. 3.—CHARGING PLATFORM, SHOWING METHOD OF HANDLING MATERIAL.

on these charging cars, using one beam for each kind of iron, and the transfer car is then brought opposite the track to the cupola platform and the little car pushed off and carried to the cupola floor.

The sand bins are located in the lean-to and are filled

from cars as these are switched on to the sidetrack reaching this part of the works.

Below the floor of the charging platform and above the sand bins are located bins for facings, flour, core compound, etc. These are reached through manholes in the charging platform and chutes connect them with the main floor of the foundry. In the rear of the cupola is a well equipped wash room. In the general construction of the building attention has been paid to the convenience and comfort of the workmen, especially in the matter of light and ventilation.

The heavy character of the castings turned out in the foundry of the William Tod Co. is shown in a recent heat of 125 tons, of which 80 tons were required for a single casting, a bed-plate for a large engine. Another innovation at this shop is the introduction of a slag car, into which is received the slag from the cupola, instead of having this scattered over the floor in the rear of the cupola. A square cast iron box is mounted on narrow gauge trucks, and before any slag enters it a heavy wrought iron hook is placed in the center of the box. When the slag has cooled off a crane is hitched on to the hook and the whole mass of slag is removed in a body, thus avoiding extensive handling as well as the annoyance of having coke and iron mixed up with the slag when the bottom is dropped.

FIG. 4.—FOUNDRY YARD, SHOWING RUNWAY EXTENSION CARRYING ELECTRICAL CRANES.

The illustration showing a general view of the interior of this foundry makes it plain that the greater part of the output is heavy castings. Many of these are molded in loam and dry sand, and the method of drying by natural gas some of these molds, which are too large to be handled, as shown in the illustrations of a large flywheel, is one that must commend itself for cleanliness and general efficiency. In the mold shown gas burners are distributed throughout the rim of the wheel as well as one in the hub, all of these being connected with the main supply of this fuel through rubber hose.

FIG. 5.—DRYING THE MOLD FOR A LARGE FLY-WHEEL BY NATURAL GAS.

At a special meeting of the stockholders of the Joliet Wire Co., Rockdale, Ill., to be held on Saturday, Oct. 25, the affairs of that corporation will be wound up and the charter will be surrendered. This action is little more than formal, however, as the plant has been idle for some time and most of the machinery has been sent to the plant of the Alabama Steel & Wire Co., Ensley, Ala. The company was organized five or six years ago to manufacture a patented wire fence invented by C. E. Robinson.

No. 3 furnace of the Ohio plant of the National Steel Co., Youngstown, O., was blown in last week after an idleness of two months. The furnace received extensive repairs during that period.

NOTEWORTHY DEVICES.

Screw Tray and Screw Driver.

To the Editor:

Perhaps some of your readers will be interested in the little shop kink which is illustrated in the accompanying sketches. The little tray shown in Fig. 1 is for the purpose of holding the screws in position to be picked up by the screwdriver shown in

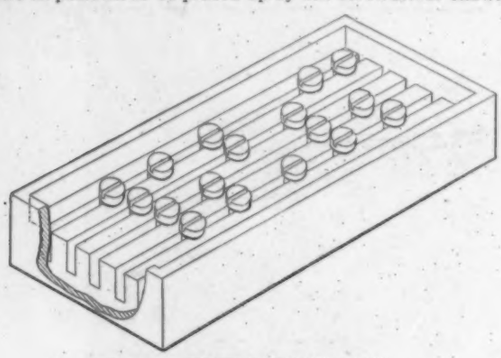


FIG. 1.—A SCREW-HANDLING TRAY.

the engraving at Fig.2. For the assembling bench I have found this tray and screwdriver to be of the greatest value.

A box of screws can be poured into the tray and with two or three shakes every screw falls into position. By driving small brad nails in top of the ribs the screws fall into the grooves more readily. This improvement is not shown, however, in the engraving of the tray. The screwdriver or "pick up," as I call it, is then pressed over a screw, the spring sides of the screwdriver being stiff enough to hold the screw, so that it can be entered in the tapped hole and turned until the pressure increases to a point where the screwdriver rotates on the screw a quarter or half turn and the positive driver slips into the slot of the screw head and a strong pressure can then be applied to the work.

I have used this outfit for some time on assembling brush

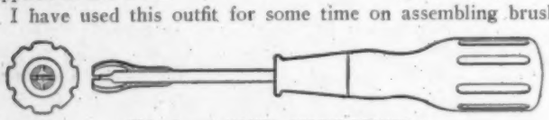


FIG. 2.—A NOVEL SCREW DRIVER.

holders in the manufacture of motors and dynamos at the plant of James Clark, Jr., & Co., of Louisville, Ky., and have found it a great time saver. J. S. BORDEN.

Louisville, Ky.

A Pocket Spirit Level.

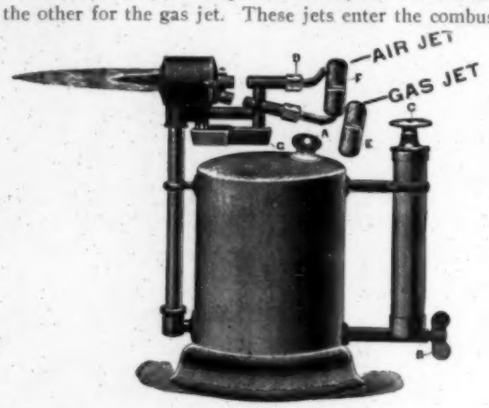
The common type of spirit level has maintained its form and field for so long that substitutes are unexpected. The form taken by one of these is essentially different and fills a wider field of usefulness both in capacity and compactness than its predecessors. This pocket level consists of an accurately ground lens screwed to a nicely finished base by means of a

cap. The hollow of this base is filled with alcohol, leaving a small air bubble in it and when the level is set on anything perfectly true the bubble will show directly in the center of the lens. When the work is out of truth in any direction the bubble will show in what particular the surface is out of level. Hence the name of the instrument, "Which Way." With an ordinary straight level the work has to be tried first one way and then another, and so on until the work is set true, but with the level shown in the illustration there is no guessing as it instantly indicates "Which Way" the surface is inclined from the horizontal.

The instrument was formerly made of brass but considerable trouble was found in keeping the liquid from leaking and after a good deal of experimenting it was decided that in order to perfect them it would be necessary to make the cases out of steel. They are now made out of this metal and give general satisfaction. These pocket levels are made by the inventor, E. G. Smith, of Columbia, Pa., who also manufactures a number of improved calipers and micrometers.

Double Jet Torch for Brazing, Tempering, Etc.

The Turner Brass Works, Chicago, manufacture the Turner double jet torch illustrated herewith. These torches are interesting to mechanics on account of their great heat producing qualities due to the special construction of the burner. The latter is controlled by two separate valves, one for the air jet and the other for the gas jet. These jets enter the combustion



chamber separately and are there united into one intensely hot, pointed flame which can readily be changed to a broad flame of equal intensity. The Turner double jet torch, it is claimed, will fuse nickel easily, requiring about 3,000 degrees F., while the ordinary single jet torch on the market will not flow brass successfully, which only requires about 1886 degrees. This torch is useful for brazing, tempering, annealing, soldering, burning off paint, or similar work.

Master Steam Boiler Makers' Association.

The first annual convention of the Master Steam Boiler Makers' Association will be held at the Great Northern Hotel, Chicago, Oct. 9, 10 and 11. The association is young, but has been steadily growing and promises to have a prosperous and useful history. It will endeavor to promote scientific boiler making. One of the objects of the association is the use and adoption of rules and methods of construction and inspection by men who have given this matter years of active study and service and who actually build boilers. The result, it is hoped, will be to insure better boilers and better protection of the public as well as of the workers. Every eligible person is invited to attend the convention. Among the topical questions which will be discussed are the following:

How shall boiler inspection be made, and how shall we determine the safe working steam pressure?

Should the steam pressure be reduced as the boiler increases in age, and at what percentage per year of age for the different types of boilers, as follows: Plain vertical, submerged tube vertical, horizontal tubular, water tube, locomotive portable, marine boilers and others.

What factor of safety shall we use for the safety of a steam boiler?

Should rivet holes in boilers be drilled, punched full size or punched and reamed?

Can steel tubes be welded successfully in an oil burning furnace?

What is the best flux to use for welding tubes?

What is the proper thickness for side, door, crown and back flue sheets in locomotive, marine and firebox boilers?

What is the best method of connecting a dome to a boiler?

What do we know about the fatal blue heat?

Is it dangerous to indulge in irregular shapes subject to pressure?

What has been our experience in the shrinkage of marine flanged boiler legs or mud rings?

Why do boilers foam?

What is the proper size safety-valve area for a given grate surface?

The secretary of the association is George M. Clark, 1377 N. Maplewood Ave., Chicago.

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G. H. GARDNER, President and Treasurer.
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A. I. FINDLEY, - - - - - - - - - - - EDITOR.
ROBERT I. CLEGG, - - EDITOR MACHINERY DEPARTMENT.
GEORGE SMART, - - - - - - ASSOCIATE EDITOR.

CHICAGO: 519 Monadnock Block, GEO. H. GRIFFITHS, Manager.
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OCTOBER 2, 1902

SURPLUS CAPACITY IN SHEET AND TIN PLATE MILLS.

It would seem reasonable to assume that when a large amount of capital is invested in a manufacturing plant the builders would first assure themselves that the prospects of success were moderately certain. In times of such prosperity as the past few years have witnessed one would not look for capital to be invested in an overcrowded industry, when manifold opportunities are presented for investment in lines which are not crowded.

These assumptions have been shown to be entirely erroneous as applied to the sheet and tin plate trade. A survey of the situation today proves that money has been recklessly spent in the building of new sheet mills and tin mills. That there are entirely too many mills is reflected in the state of the trade; many mills are shut down from lack of orders and the buying trade generally expects a decided drop in prices by the end of the year. If the state of the market is not considered an index of the overdone condition of the industry, some figures just collected and not heretofore made public must be accepted as positive proof. There are now, outside of the United States Steel Corporation, mills built and in operative condition, and in actual course of erection, as follows:

	Built.	Building.	Total.
Sheet mills	132	47	179
Tin mills	93	57	150
Totals	225	104	329

The American Tin Plate Co. has in regular operative condition about 250 tin mills, and about 25 more located in plants which are not counted upon for regular production, but which could be operated or the mills in them removed to more advantageous locations and there set up. The plans of the company contemplate such removal whenever it may be necessary. The American Sheet Steel Co. has about 170 sheet mills, all in operative condition. It is better to compare capacity than mills, especially in the case of the sheet mills, and we therefore make the statement in the form below:

	Sheets. Gross Tons.	Tin Plates. Gross Tons.
Capacity of independent mills, built and building	500,000	200,000
Capacity of Corporation mills	470,000	535,000
Total	970,000	735,000
Production in 1901	500,000	400,000

These are by no means outside estimates of capacity. The steel corporation capacities are under the official statements, and the independent mills are rated on a moderate basis—in the case of independent sheet mills at considerably less than the average of the corporation's mills. The tin plate production of 1901 is the official figure, while the sheet production has been carefully estimated. It is scarcely necessary to observe that last year brought out the full domestic demand. Tin plate production in that year was almost a third greater than in 1900, and nearly 10 percent greater than in 1899. The prospects for this year and next are not for any substantially greater production of tin plates and sheets than in last year.

The trade press has kept the discriminating public well informed as to the progress made in the building of independent mills. The facts of production have all been open to those who desired to enquire. Yet we now find a prospective capacity, in both sheets and tin plates, almost double the greatest demand that can be expected. A survey of the movement leads one to believe, however, that most of the projectors of independent mills have not carefully gone over the ground to determine the real prospects of success or failure. The most common stand taken, especially by the more recent investors in independent mills, is that they stand as good a show of success as the others.

The question must ultimately resolve itself into one of competition with the United States Steel Corporation. The large capitalization of the corporation has been taken as a ground for believing that prices will be maintained at a level which will permit independent mills to continue profitable operation. This forces the assumption, in view of the great excess of capacity, that the corporation managers will allow trade to leave them, in order to continue paying dividends! Nothing could be more ridiculous than such a position. Dividends are not paid by maintaining prices, but by making and selling the goods. The ultimate failure of the corporation would be the inevitable result of allowing the trade to go to outside mills, and such a failure would be so disastrous to the iron trade as to leave practically no demand for any mill to fill.

Many of the mills built or building involve the highest cost for mill construction known for many years, a cost two or three times in excess of the basis on which the corporation mills were built. They represent long delays, during which salaries are paid and the early money invested lies unproductive. That such mills are expected to make their return to the investors in the period which would follow the departure of the trade from the United States Steel Corporation is a poor commentary on the conservatism of their builders. Such a failure on the part of the corporation would reduce these costly mills to the value of scrap. The depreciation would represent the most optimistic estimate of earnings for a period of many years.

Assuming on the other hand that the hopes of the independent mills do not really rest on the failure of the steel corporation, but that each expects that it will be one of the few favored outsiders that may survive along with the corporation—a vastly more logical assumption than the other—it must ultimately develop that some of the independent mills can make the product at a fair profit, and yet that the volume of such independent production shall be too small to induce the corporation to make further reductions in selling prices. Such a delicate balancing of trade is out of the question. In times of slack demand the capacity of

the corporation mills will exceed the demand, and a hard struggle for trade will be inevitable.

It is not surprising, therefore, that the buying trade is satisfied at the present time that not many months hence there will be such a reduction in prices of sheets and tin plates as may be required to show up the actual strength of the respective producers.

IRON AND STEEL IMPORTS AND EXPORTS.

The importation of iron and steel, as shown by the report of the Treasury Department, is rapidly increasing, the imports of pig iron being 17,291 tons more for August than for July, while the imports of steel were 2,903 tons more in August than in July. The following table shows the pig iron and steel imports since Jan. 1. The column of steel includes ingots, blooms, slabs, billets and bars of steel and steel "not elsewhere specified," structural steel being thus included:

IMPORTS OF PIG IRON AND STEEL—GROSS TONS.

	Pig Iron	Steel
January	7,833	5,313
February	8,307	2,235
March	17,184	6,570
April	19,067	11,986
May	30,708	24,388
June	32,458	35,588
July	62,156	36,124
August	79,447	39,027
	257,210	161,231

The following table gives in detail the imports for August and for the eight months ending with August:

IMPORTS OF IRON AND STEEL TO THE UNITED STATES—GROSS TONS.

	August		Eight mos. ending August	
	1901	1902	1901	1902
Pig Iron	4,301	79,447	28,281	257,210
Scrap	4,363	13,759	12,920	62,409
Bar Iron	2,424	2,515	12,494	14,550
Iron and Steel Rails	18	1,988	871	23,463
Hoop, band or scroll	347	311	804	3,068
Steel ingots, slabs, billets or bars	746	39,027	5,235	161,231
Sheets and plates	794	365	2,985	4,256
Tin and terne plates	8,448	2,807	42,128	42,475
Wire rods	1,726	1,663	11,584	12,771
Wire and wire articles	160	232	2,266	2,312
Total	23,327	142,114	119,568	583,745

The total value of iron and steel imports for August, not including ore, was $4,123,314, against $1,865,772 for August, 1901. For eight months the total was $23,456,760, against $12,210,381 to the end of August, 1901. Iron ore imports in August were 113,788 tons, against 122,820 tons in August, 1901, and for eight months 796,278 tons, against 609,058 in 1901. Exports for August were about the same in tons as for July, but considerably less than for August, 1901. For the eight months, the total values were: for 1902, $65,904,829, and for 1901, $69,346,379. For August the total value was $8,641,525, against $8,185,649 in August, 1901. The following table shows the exports in detail:

EXPORTS OF IRON AND STEEL FROM THE UNITED STATES GROSS TONS.

	August		Eight mos. ending August	
	1901	1902	1901	1902
Pig Iron	2,230	2,531	46,828	22,203
Scrap	2,334	519	9,518	6,759
Bar Iron	673	350	15,376	16,861
Wire rods	619	5,014	3,716	14,751
Steel bars	1,713	747	20,177	7,006
Billets, ingots and blooms	275	464	27,053	1,794
Hoop, band or scroll	16	47	1,009	1,315
Iron rails	189	0	606	177
Steel rails	18,304	5,569	249,281	60,036
Iron sheets and plates	307	499	5,317	2,663
Steel sheets and plates	1,220	1,197	20,933	10,633
Tin plates, terne plates and taggers tin	4	86	407	1,296
Structural material	2,021	2,904	36,223	41,848
Wire	5,573	7,114	53,681	66,804
Cut nails	549	542	7,558	5,098
Wire nails	1,486	2,760	13,386	17,694
Other nails including tacks	143	248	1,243	1,257
Total	37,636	30,631	512,312	278,195

The Claysville Foundry & Mfg. Co., of Claysville, Pa., has been incorporated with a nominal capitalization of $1,000. The new company has a gray iron foundry under course of erection at Claysville.

THE WAGE REDUCTION ON EXPORT TIN PLATE.

(Special Telegram.)

PITTSBURG, Oct. 1.—The meeting of the tin plate conference committee of the Amalgamated Association and the officers of the American Tin Plate Co. is still on in New York, although it is probable that a definite agreement on the foot notes which are under discussion and the wage reduction on rebate tin plate will be reached some time today. The conference has been in session since Monday morning and the wage reduction on rebate tin plate is being thoroughly discussed. The Newcastles lodges had meetings last week to discuss the reduction on rebate tin plate but had only a very small number of their members in attendance. While nothing definite can be learned it is stated on reliable authority that the representatives of the Amalgamated Association have been given authority to accept the 25 percent reduction or a similar offer on rebate tin plate if they deem it wise to do so.

New Wire Trade Association.

(Special Telegram.)

PITTSBURG, Oct. 1.—A meeting of the leading wire and wire nail interests will be held within a few days for the purpose of organizing another association similar to that which has existed for nearly a year and which is non-effective at the present time. The cutting of prices on wire nails and wire products continues and it is rumored that some of the concerns that have been the leaders in making concessions during the past two months will not be included in the new organization. A meeting of the cut nail manufacturers will be held on Tuesday, Oct. 7, for the purpose of discussing trade conditions. No changes in prices are expected for the reason that the market is very strong and nearly all the manufacturers are behind on their orders.

The Nine-Hour Day in the Foundry.

In accordance with the action of the recent Toronto convention the Iron Molders' Union is now pressing the issue of a nine-hour day upon foundrymen in preference to questions of wage advances. The recent settlement between the molders and foundrymen of St. Louis for the year beginning July 1 included an agreement that the conference committee would recommend that a meeting of the members of the National Founders' Association and the union molders in the cities of Cleveland, Cincinnati, Chicago, St. Louis, Indianapolis, Detroit and Milwaukee, be held within the ensuing three months with a view of establishing a nine-hour workday in these cities not later than Jan. 1, 1903. In compliance with this agreement a conference between representatives of the two organizations from the cities named will be held in Detroit on Oct. 7 to discuss the situation and make some recommendation to the founders and molders concerned.

Another labor matter of interest to foundrymen is the probability of a merging of the Core Makers' Union and the Iron Molders' Union. The proposal has been favorably acted upon by the convention of the core makers and the referendum vote is expected to result in union. There has not been harmonious action by the two sets of workers on all occasions, but organic union would of course ensure this.

National Steel & Wire Co.

The recent incorporation of the National Steel & Wire Co., under Maine laws is announced. The capital is $5,000,000, one half preferred. The new company takes over the National Wire Corporation, of New Haven, Conn., and the DeKalb Fence Co. and the Union Fence Co., both of which have plants at DeKalb, Ill. Further announcement of the plans of the company will be made in the near future. At the New Haven plant a rod mill of the Belgian type was completed recently and is in successful operation. In addition to fencing a specialty will be made of the manufacture of fine wires.

The Alabama Steel & Wire Co., of Birmingham, Ala., has purchased material and will begin at once to erect 300 bee hive coke ovens at its mines at Virginia, Ala. It is the expectation to begin coke making by Jan. 1.

The United Engineering & Foundry Co.'s System of Shop Records.

The shop system of the United Engineering & Foundry Co., of Pittsburg, is not asserted by those who have developed the plan and have it in charge, to be superior to other methods in use elsewhere. In point of fact the method is regarded as being rather the rough and ready expedient that is thrust into action long before ripened development of details has rounded out the arrangement to suit best the peculiar requirements of the plant. The system, indeed, like many others of a similar character, has been produced under that stress of needful shop service which denies delays incidental to the full fruitage of the scheme, and these conditions are adverse to any other than an approximation to the necessities of the case. Installed under such circumstances, a system carries along by sheer momentum a number of surplus items which are gradually discarded when those in charge have a convenient season to

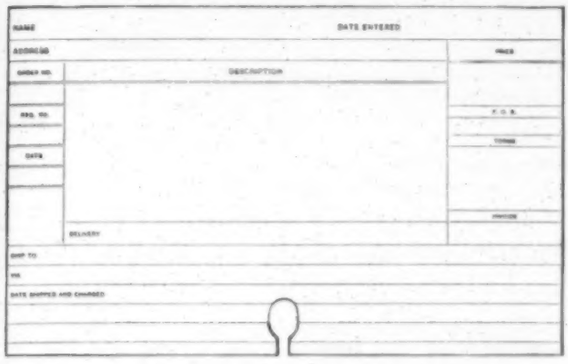

FIG. 1.—SHOP ORDER CARD.

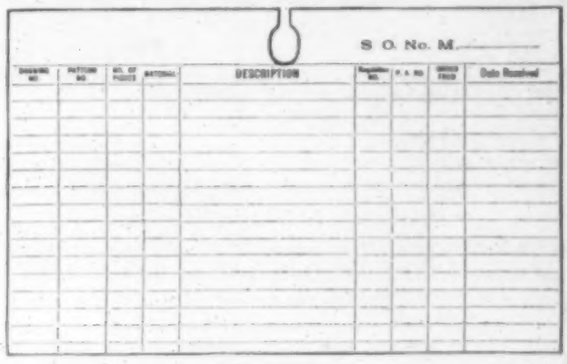

FIG. 2.—THE BACK OF ORDER CARD SHOWN IN FIG. 1.

cut them loose—and convenient seasons to attend to matters of this kind are few and far between in these busy times.

The system under consideration does not have any excess of these detracting and impeding attachments. Indeed it seems to the writer that there are few, if any, superfluous and time-consuming details to be found either in the method itself or its application to the varied requirements of a modern plant. President Frank, of the United Engineering & Foundry Co., and Mr. Knotts, of the purchasing department of the Frank-Kneeland plant, who comes constantly in touch with the scheme in connection with the shop and office, do not look upon it as a final and perfected arrangement by any means; but it meets their demands fairly well, and on the broad gauge theory that the old maxim regarding familiarity has some weight it is easy to understand how the merit of the present plan may escape appreciation in the field of its particular development.

Mr. Frank says: "It serves our needs quite well, but I have never felt that it was on a scientific basis. Certainly it is anything but the ideal that one could hope for in an accurate cost-keeping system. So far as that goes I fail to see how absolute accuracy is to be obtained unless at a cost for clerical labor that would be out of the question. For instance, there are a number of items in estimating work which vary independently of each other. The time taken by a molder in getting out a piece of work is not always an indication of the weight of the completed casting. His work may increase with the weight or it may run the other way. So with coremakers, laborers and so forth. We take these latter items and charge them up pro rata against the shop product, but do our best to keep track of the weight and labor of direct molding."

Card Index Order Forms.

The office orders were originally received and entered in a stub book and several carbon copies taken which were torn out for distribution to the different departments. The book was a nuisance because of the difficulty in making rapid reference (any other sort of a reference was out of the question) and the old order system has been cast aside in favor of the card index. The new card is illustrated in Figs. 1 and 2, which show the two sides of a piece of thin but strong cardboard having dimensions of 5x8 inches. Fig. 1 covers the order fully in regard to name and address, price and terms of payment, shipment, the desired and the actual (not always identical, of course) date of delivery, etc. On the back of the same card, Fig. 2, we find the shop order number together with a record of the requisition dates, drawings, patterns, pieces and material required for the work.

The order card, Fig. 1, is the starting point whence some nine lists of material are prepared. These are identical in heading with the one shown in Fig. 3; in fact they agree in the items specified to the following extent: Order No., Machine No., Name of Machine, For, Drawing No., Pattern No., No. Pieces, Material and Name of Piece. This enables the

Order No.
Machine No.
Name of Machine
For

PITTSBURG,

UNITED ENGINEERING AND FOUNDRY CO.

DRAWING NO.	PATTERN NO.	NO. PCS.	MAT'L	NAME OF PIECE	ACTUAL WEIGHT OF EACH PIECE	WEIGHTS	TOTAL WEIGHTS	RATE	COST	MACHINE WORK	FITTING	CORE MAKING MOULDING	PATTERN WORK LUMBER, FEET	PATTERN WORK LABOR, HOURS

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FIG. 3.—LIST OF MATERIAL FOR MILL OFFICE AND CONTRACTING DEPARTMENT.

several copies to be gotten out speedily and a copy of Fig. 3 is promptly available for the mill office and the contracting department. The sheet, of which a portion is shown in Fig. 3, is 12x14 inches. On the back of Fig. 3 is printed another form which occupies about one-eighth of the available space thus permitting the large sheets to be folded uniformly and having the endorsement appear in plain sight when so reduced. The form on back of Fig. 3 is a summary of the contents as entered on the face of the document and in general form it is arranged as follows:

Order No.....
Machine .....
.....
For .....
Designed by .....
Built at .....
Drawing Nos. .....
.....
.....
Contract Price .....
F. O. B.....
Delivery .....Date .....

The sheets prepared at the same time as Fig. 3 are, as indicated above, of corresponding style to that sheet and need not be illustrated by separate engravings. One copy is made out for the mill office, a couple are sent to the foundry and one to the engineering office. These sheets have five columns on the right of the page. Four of the columns are headed Molding, Weight, Total Weight, Price, and one column is left blank. These take the place of the columns shown in Fig. 3 and the sheet on that account is correspondingly narrower. The list sheets which are sent to the machine shop, pattern shop and purchasing department are practically the same as the others with the exception of the columns to the right which are headed respectively: Order From, Order No., Date, Received and Remarks.

The United Engineering & Foundry Co. comprises several shops of which any two or more may combine in the production of a piece of work. The intercourse in a business way between the separate units of the organization is handled precisely as if they were independent of each other, and the system of requisitions for material in filling orders as set forth by the shop lists is therefore a matter for detailed and exact treatment and record. This will explain the thorough-going character of the lists of material and the accompanying data. The parts of the different forms which are similar and contain the same information are filled out at the one time and the remaining columns are cared for in the various departments as the requisitions are honored and the supplies reach the shop, are weighed, worked up and the labor cost, etc., ascertained in detail.

In the Foundry.

When the list of material reaches the foundry, the foreman compares the list as early as possible with the patterns and pattern cards which are supplied or accounted for by the pattern department. The pattern cards accompany the patterns through the shops and foundry, and from them the clerks derive most of the data for keeping track of the work while in process of molding, etc. The foundry foreman can then proceed to make up his list of heats, etc., as illustrated in Fig. 4. This form is 7¼x8½ inches and a separate sheet is reserved for each cupola or furnace. It may be pointed out that the terms No. 1 Iron, No. 2 Iron, etc., do not necessarily refer to the grade of material, but in this case are employed to designate the different piles of the stored pig iron. The iron when received by the clerk is placed according to convenience of handling and the series of pig iron piles have thus a purely conventional arrangement which is peculiar to the layout of the plant.

CUPOLA No. ..... Date, ... Foreman.

CHARGE No. 1.	COKE.	CHARGE No. 4.	COKE.
No. 1 Iron,		No. 1 Iron,	
No. 2 "		No. 2 "	
No. 3 "		No. 3 "	
No. 4 "		No. 4 "	
No.		No.	
No.		No.	
Foundry Scrap,		Foundry Scrap,	
Stock Scrap,		Stock Scrap,	
CHARGE No. 2.	**COKE.**	**CHARGE No. 5.**	**COKE.**
No. 1 Iron,		No. 1 Iron,	
No. 2 "		No. 2 "	
No. 3 "		No. 3 "	
No. 4 "		No. 4 "	
No.		No.	
No.		No.	
Foundry Scrap,		Foundry Scrap,	
Stock Scrap,		Stock Scrap,	
CHARGE No. 3.	**COKE.**	**CHARGE No. 6.**	**COKE.**
No. 1 Iron,		No. 1 Iron,	
No. 2 "		No. 2 "	
No. 3 "		No. 3 "	
No. 4 "		No. 4 "	
No.		No.	
No.		No.	
Foundry Scrap,		Foundry Scrap,	
Stock Scrap,		Stock Scrap,	

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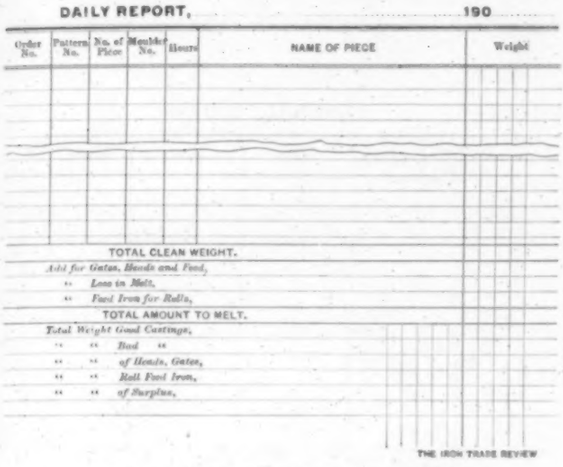
FIG. 4.—LIST OF HEATS, ETC., TO BE FILLED OUT BY FOUNDRY FOREMAN.

The daily report of the foundry is illustrated in Fig. 5, which in the original sheet is 7x12 inches. This form covers the list of pieces made with the number of hours expended on molding. The weights, as indicated by the column on the right, cannot be entered until a later date and in practice this column is not used as the material list sent by the foundry in the first place provides an opportunity for covering all requirements. The lower portion of the form is filled out for the use of the office force who check up the work of each molder in a journal. This journal has the two facing pages assigned to each day's work in the foundry and the whole of the left hand page and the greater part of the right hand page is given up to a repetition of the form shown on the upper part of Fig. 5.

The lower part of the right hand page of the book is ruled off as in Fig. 6. This is practically a ledger account with the cupolas and furnaces and the method of balancing the respective debits and credits is a constant check upon the work of the foundry. The amount of material used in the foundry is thus kept in account with the diminishing stock on hand and the quantity is replenished from time to time as the drain of daily requirement reduces the supply from the prescribed minimum.

The castings as they are taken from the sand, brushed,


DAILY REPORT, ... 190 .....

Order No.	Pattern No.	No. of Piece	Moulder No.	Hours	NAME OF PIECE	Weight

TOTAL CLEAN WEIGHT.
Add for Gates, Heads and Feed,
" *Loss in Melt,*
" *Feed Iron for Rolls,*
TOTAL AMOUNT TO MELT.
Total Weight Good Castings,
" " *Bad* "
" " *of Heads, Gates,*
" " *Roll Feed Iron,*
" " *of Surplus,*

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FIG. 5.—DAILY REPORT OF THE FOUNDRY.

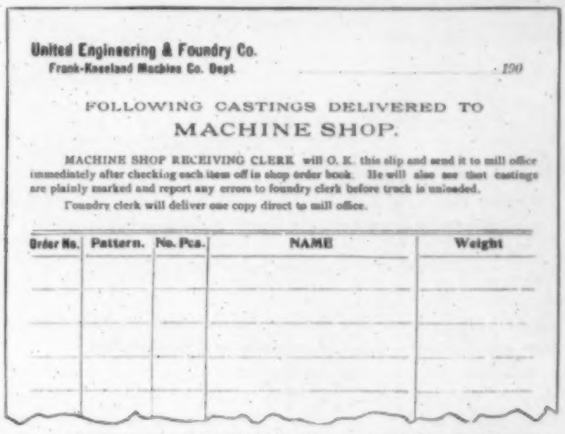
pickled and snagged, are checked, weighed and delivered to the machine shop with the slip shown in Fig. 7. This is a 5⅜x7¾-inch sheet taken from a stub book and made out in duplicate. The original goes to the machine shop whilst the copy is sent direct to the mill office. The stub remaining in the book retains a copy for the use of the foundry.

In the Machine Shop.

The machine shop time slip is given in Fig. 8 and is 3x5 inches. These are made up in pads for convenience and are restricted to one kind of work. Each workman and every machine bears a number which is inserted in the appropriate column, and on the completion of the day's labor the slip is approved by the addition of the foreman's name and sent to the office. These time slips are used by the machinists at work on lathes, etc., but a different slip is adopted for the fitting department. This is illustrated by Fig. 9, which in the original is 3¼x9 inches. The fitters do not use any other time slip and the form seen in Fig. 9 is filled out by the foreman in charge. The first two items (on the top line) are explained by the fact that several cards may be in use on the one job and following the general plan adopted by the company each card is restricted to a special purpose which is so stated at the head of the card on the two vacant lines beneath the "Shop Order No." The entire series of operations might require eight cards, for example. The "8" would be entered at the left and the number at the right would be any numeral in the series from unity up to that number and the cost-keeping department is thus at once in touch with the exact number of cards required and used for the set of operations.

A Turret Lathe Work Form.

The attempt of the office to drive some strengthening nails into the system and thereby to hold the working parts in order with the least amount of dependence upon the shop force is


United Engineering & Foundry Co.
Frank-Keeland Machine Co. Dept. ..... 190 .....

FOLLOWING CASTINGS DELIVERED TO
MACHINE SHOP.

MACHINE SHOP RECEIVING CLERK will O. K. this slip and send it to mill office immediately after checking each item off in shop order book. He will also see that castings are plainly marked and report any errors to foundry clerk before truck is unloaded.
Foundry clerk will deliver one copy direct to mill office.

Order No.	Pattern.	No. Pcs.	NAME	Weight

FIG. 7.—DELIVERY SLIP USED BY SHIPPING DEPARTMENT OF FOUNDRY.

well shown by Fig. 10. This form in the original is 6x8 inches and is ruled off into ¼-inch squares. This is a most useful sheet and admirably serves several purposes. The heading gives the order number for the turret lathe department, the drawing, pattern and shop order numbers, the date, workman's number and the hours, whether on day or night turn, requisite to get out the work. There is also a record of the size and shape of steel used and a list of the number, size and kind of stock nuts needed for the job. The squared part of the sheet has a value beyond this and provides a way out of a difficulty familiar to many students of management matters. The average blueprint covers a variety of pieces and is apt to be confusing to the turret lathe man in particular. His class of work is usually but a fraction of the amount demanded by the entire drawing sent to him. It has been proposed, and in some shops the plan has been put into practice, to have the work subdivided so that the working drawings would be in small and conveniently handled sheets. The United Engineering & Foundry Co. carries this plan further than the majority of firms so far as the experience of the writer goes and it must be conceded that the plan of operation is conducted in a very inexpensive manner. The simple squared portion of Fig. 10 is

RECAPITULATION.

Cupola Charge		Weight Charged	
No. 1 Iron		Weight of Good Castings	
" 2 "		" " Bad "	
" 3 "		" " Surplus	
Stock Scrap		" " Heavy Gates	
From Furnace		Lost in Melt	
Total Weight Charged			
Total Amount Coke			
Furnace Charge			
No. 1 Iron		Weight of Good Castings	
" 2 "		" " Heads	
" 3 "		" " Surplus	
Foundry Scrap		To Cupola	
Stock			

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FIG. 6.—PRODUCT AND CONSUMPTION BY CUPOLAS AND FURNACES.

employed for a rough sketch of a single part—the ¼-inch divisions being extremely useful in speedily laying out the part plainly. The piece is dimensioned and the ever present possibility of error is reduced to a minimum. There is nothing about the sketch to detract the attention of the workman from the exact task assigned to him and the sheet when turned into the office is as straightforward and satisfactory a record of the workman and his work as can well be imagined. The simplicity of the scheme is a decided bar to many possible mistakes anywhere between the management and the workmen.

MACHINE SHOP TIME SLIP.

Date *190*

Order No. ..... *Drawing No.* ..... *Pattern No.* .....

No. Hours	DESCRIPTION OF WORK	MACHINE

Workman No. ..... *Foreman.*

Enter only one kind of work on this slip and make all memoranda on the back

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FIG. 8.—MACHINE SHOP TIME SLIP.

A similar form of exactly the same size is used in the smith shop. This sheet, however, lacks the part marked out by heavy lines in Fig. 10 for the enumeration of stock nuts. The smith is not considered so free from interference in the course of his work as the turret lathe man and he may occasionally be taken away from the task assigned him on the one smith shop order to take up another job before the first shall have been completed. The heading of the smith shop order is slightly changed, therefore, to allow of this introduction of another piece of work. A line running across the top of the order sheet reads: "Start.....Stop .....
Start .....Stop .....Start .....

character of the work done is easily indicated by an initial B, T, F, or C, showing whether the piece was bored, turned, faced or chased, and so on with other machines. The record gives the particular size of machine upon which operations were performed in finishing up certain parts and this too is a salutary system in general.

The plan is evidently carried out in accordance with that view of a manufacturing plant which takes into consideration

.....Cards Card No.....

S. O. No. .....

GENERAL FITTING

Man's No.	DATE	START	STOP	HOURS

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Total Hours .....

FIG. 9.—TIME CARD FOR FITTING DEPARTMENT.

the remunerative quality of each foot of space and the relative advantage of every grade and size of tool. When the work accomplished on a machine is duly weighed in connection with the means employed for its production the estimate is a close parallel with the relative efficiency and general worth of the product of workmen receiving different rates of remuneration.

TURRET LATHE ORDER No. ..... *Drawing No.* ..... *Pattern No.* ..... *S.O.* .....

Date Issued ..... *Man's No.* ..... *Hours* .....

NIGHT TURN " " ..... " .....

SIZE AND SHAPE OF STEEL USED .....

STOCK NUTS		
No.	*Size*	*Kind*

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FIG. 10.—ORDER AND SKETCH SHEET FOR TURRET LATHE DEPARTMENT.

Finish." A space is assigned for the "Total Hours" and another for the "Finished Weight" of the product whilst there are suitable blanks for "Size of Iron Used." Everything said about the utility of the turret lathe order form applies with equal force to the sheet used in connection with the smith shop. The whole thing is direct, effective and result-bringing with a minimum of attention from all concerned.

The machine shop time sheet is kept in loose leaf ledger style by means of the sheet shown in Fig. 11; a portion only of this sheet can be shown as the entire leaf measures 13x22¾ inches in the original size. This contains a time analysis of the work as apportioned between the different machines. The expense of one workman over the other is usually scrutinized closely and followed up with keen scent through the ramifications of shop procedure. The first cost efficiency and maintenance of the one machine tool over another is not so invariably a matter of record and investigation. In many shops the tools were selected in days when the purpose of the plant was entirely directed along lines foreign to the present and the old methods and machines have survived to impede and counteract the natural progress that later inventions and improvements would ensure. A sheet like the one shown in Fig. 11 is thus a constant reminder of the "how" in which work is accomplished in an up-to-date shop. The deadly

parallel is at hand for clear and convenient comparison with past and present history of shop routine and adaptation. The application of means to ends is here to be seen with accuracy and ease. The bound sheets tell a noteworthy tale of the time profitably or wastefully spent in the machine shop. It is a summary of the various time sheets of the shop arranged in a readily readable style and is equally a check upon the foreman in charge of the machines and his judgment in placing the work as well as the ability of the men who carry out his orders.

Fig. 12 illustrates a neat form which fits in very nicely in several cost-keeping directions. The card is 6x8 inches. The top line bears the name of any machine and the different parts required in the make-up of the meachanism are entered in the column to the left. The pattern number and the shop order numbers follow to the right in their respective columns and

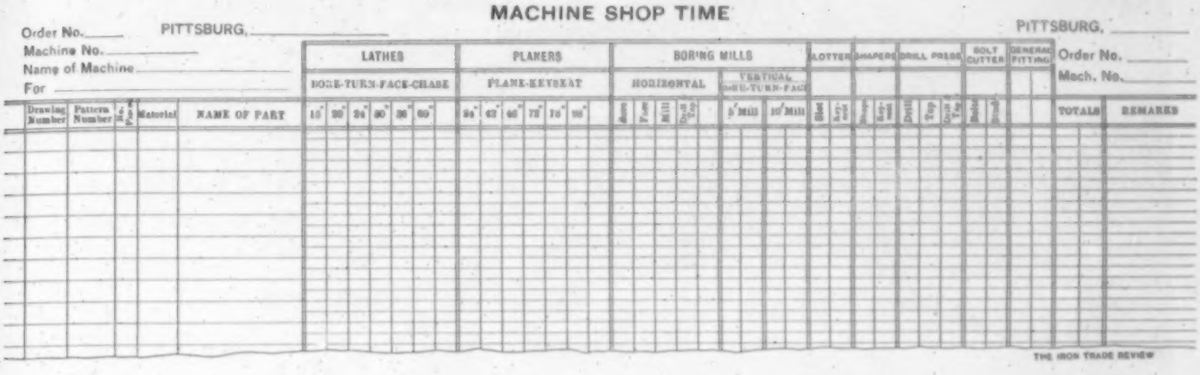


FIG. 11.—TIME AND DISTRIBUTION OF MACHINE SHOP OPERATIONS.

these also contain an account of the time taken in the production in the machine shop of the one part at the various dates from which an average rate per piece can be obtained and placed in the last column. The sum of the entries in the last column will of course give the average cost per machine and by similar methods the maximum and minimum cost of any machine can be derived. The shop order number enables those in charge to get further information when this is necessary and the specific application and value of the method will be promptly recognized.

The same style of form but substituting a date for "Name of Part" and taking the vertical columns in pairs—assigning one to "Fitting" and the other to "Tools"—would give the time expended per day on the several orders in hand. But the in-

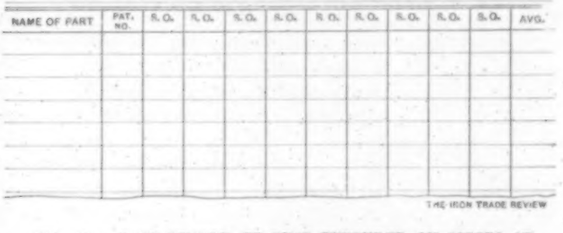


FIG. 12.—CARD RECORD OF TIME EXPENDED ON PIECES AT VARIOUS DATES.

stances shown are sufficient to illustrate the general scheme in the light of a plain every-day working system and the flexibility and breadth of the plan in practice are among the leading factors in attaining so marked a measure of success as that enjoyed by the company.

The International Importing & Mfg. Co., having headquarters in New York, and a plant at Waterville, Me., will do a general manufacturing business, having purchased or obtained options on a number of patents. The company is also prepared to handle machinery and tools of all descriptions in the European markets, particularly in France, Austria, Hungary, Turkey, Egypt, Roumania and Bosnia. A representative whom the company has just sent to Europe has connections which will assist him in controlling trade in machinery lines and bring to American manufacturers orders which have heretofore been placed in Germany and England.

AN ENGINE WITH NO EXPENSE FOR FUEL.

The Providence *Journal* reprints a letter sent to Gardner C. Sims, formerly of Armington & Sims and now with the William A. Harris Engine Co., of Providence, R. I. The writer of the letter has evidently great faith in the practical character of his invention otherwise he would not have broached the matter so confidently to a mechanical engineer of standing. The improvement in question is a "pneumatic engine worked by compressed air without any expense for fuel." The inventor thus outlines his scheme:

"The immense value and vast field for business with this invention is inconceivable, inasmuch as it will soon supersede on land and sea all kinds of steam engines or any other fluid as a motive power in the different branches of arts, industry and commerce. It will be used in almost every house for producing light, heat for cooking and other purposes, and in one way or another it will reach and be used by all kinds of people.

"The following are some of the advantages and merits of my invention to successfully compete with existing engines of all kinds: It produces power without fuel of any kind, and, therefore, saves this expense, which is worth millions of dollars for all concerned. (Some ships expend daily in coal $2,500.) In connection with an electric plant may produce light and heat without any expenditure of fuel; it dispenses with boilers, stokers, firemen, cinders, heat and dirt. It is noiseless and can be set up in any room or floor of a building and be kept clean like a watch, and leaves free the space taken by the coal and water, which is a great advantage for ships and railroads. Ships with this engine save the time, trouble and great expense of calling occasionally on one or other sea port only for coal, and at the same time their radius of action has no limit. Its size, compared with a steam engine of same horsepower, will be smaller, and, in consequence, it occupies less space. It can be made of different sizes ranging from a miniature to hundreds of thousands of horsepower, with great and satisfactory results in each case. It will last 10 times more than any of the engines known, since there is no heat, steam, water or any other corrosive substance that may destroy it. I am stating true and real facts that will soon be shown with many pneumatic engines working everywhere on land and sea.

"I think the foregoing is a tangible reason for you to invest in these patents before any one of your competitors or other interested party gets control of them. If you are willing to examine said inventions with a view of doing business with me, I will deliver you (only here in this city against a receipt signed by you), the drawings and specifications as soon as you let me hear from you in this respect."

By some oversight the inventor fails to say anything about the source of the free supply of compressed air to run the thing.

Assistant Secretary Taylor, of the Treasury Department, has issued a ruling on the exportation of structural pipes manufactured by a structural tubing company wholly from imported old steel rails and paying a duty of four dollars per ton. Mr. Taylor rules that the drawback to be allowed shall be equal in amount to the duty on the rails less 1 percent.

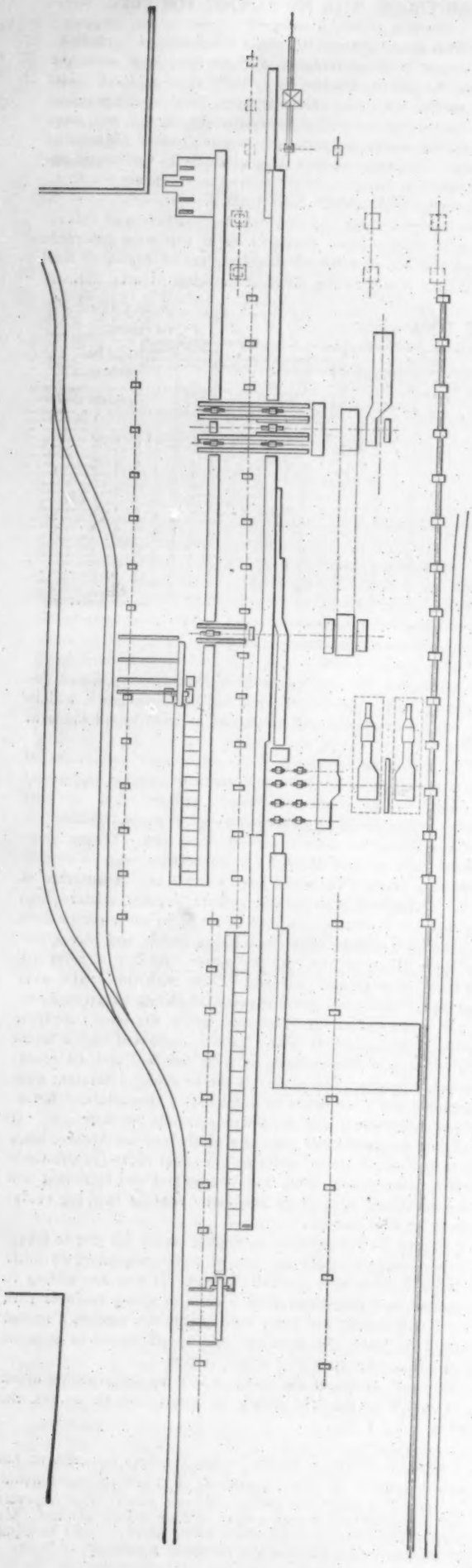


FIG. 1.—GENERAL PLAN OF BILLET AND BAR MILLS OF REPUBLIC IRON & STEEL CO., YOUNGSTOWN, O.

Youngstown Billet Mill of the Republic Iron and Steel Co.

The billet mill of the Republic Iron & Steel Co., located on the property formerly owned by the Brown-Bonnell Iron Co., of Youngstown, O., and which has been in operation since the beginning of April of this year, is located in line with the Bessemer plant of the Republic Iron & Steel Co., a description of which appeared in *The Iron Trade Review* of Oct. 4, 1900. The location of the billet mill in relation to the Bessemer plant is such that the bloom from the blooming mill of the Bessemer plant is conveyed by means of roller tables directly into the billet mill. The billet mill, of which a number of views are given in this connection, consists of three separate rolling mills. The first mill is a 26-inch semi-continuous mill, and is used for rolling the bloom into 4-inch or 3-inch billets. The second mill is a continuous billet mill, which receives the 3-inch billet from the semi-continuous mill and rolls it into 1½-inch, 1¾-inch, 2-inch or 2¼-inch billets. The third mill is a tandem mill, and is used for rolling flat bars from slabs furnished by the blooming mill.

The 26-inch semi-continuous mill consists of three stands of two-high rolls. The first and third stands of these rolls rotate in the same direction, while the middle stand of rolls rotates in the opposite direction. This mill is driven by a tandem compound engine, furnished by the William Tod Co., of Youngstown, O. The bloom rolled in this mill receives two continuous passes when running forward, and a single pass when running backward. To roll a 4-inch billet from a 7½-inch bloom, the bloom has to pass through the mill three times. To roll a 3-inch billet from the same bloom, the piece has to travel through this mill five times. Automatic tables located in front and back of this mill, and provided with specially designed manipulators, take care of the proper handling of the material being rolled. Hydraulically operated stops and switches convey the 4-inch billet or 3-inch billet down on to the shear table located in line with the 26-inch mill, or deflect the 3-inch billet into the 18-inch continuous mill, where it will be rolled into a small billet. The shear table in connection with this 26-inch mill consists of a receiving table, cooling bed and shear table. At the end of the shear table is located a Mackintosh-Hemphill steam shear, and beyond this shear are the scrap conveyor and hydraulically operated billet conveyor for loading billets into cars.

The 18-inch continuous mill consists of four stands of rolls driven by a cross-compound engine, built by the Filer & Stowell Co., of Milwaukee. This mill is provided with passes to roll 1½-inch, 1¾-inch, 2-inch and 2¼-inch billets. Beyond this mill, and in line with it, is located an Edwards flying shear, which will shear the billets coming from this mill into 15-feet or 30-feet lengths. The billets, after being sheared, pass on to a skew table, where they are assembled side by side, and then pass on to a table in front of the cooling bed, whence they are pushed on to the cooling bed. From the cooling bed the billets are loaded into cars.

When it is desired to roll a thin bar, the slab coming from the blooming mill is transferred in line with the bar mill. The latter is driven by the William Tod engine mentioned above. The first two stands of rolls of this bar mill are so arranged that the bar may receive two or four passes, in accordance with the width of the bar. After the bar has passed through the bullhead pass it runs out on to a receiving table, from which it is transferred to the shear table. The Mackintosh-Hemphill shear is located at the end of the shear table. Beyond the shear are provided a scrap conveyor and mechanism for loading the sheared bars into cars.

The mill was designed by S. V. Huber & Co., of Pittsburg, who have patents covering the main features of the plant.

The Clay-Christie Co., Cedar Falls, Iowa, recently incorporated, is just starting to build gasoline engines for electric lighting purposes. The company has a well equipped shop and foundry where it can work about thirty or forty men and is now installing considerable new machinery. It intends building direct connected lighting outfits of from 2½-h. p. to 50-h. p. and hopes to get on the market with the smaller sizes about Nov. 1.

A TENDENCY IN MACHINE DESIGN.

There would appear to be a tendency amongst machine and engine builders of the present day to make the external surfaces of their products as free from projecting parts as practicable. The older types of H and L framing, which required but simple patterns for their production, have now for some years been generally replaced with box sections requiring core-boxes, which are often complicated by the fact that stiffening ribs and the like, which an earlier generation of draughtsmen would have placed on the outside of the casting, are now arranged in the interior of the hollow frame. This smoothness of outline is to a large degree a concession to taste; but it has also many practical advantages, and by reducing the number of re-entrant angles less opportunity is afforded for the lodgment of dirt. A striking instance of the tendency in question is afforded by the growing popularity of the enclosed engine, but it did not originate with the designers of these. Indeed, whilst on the one hand the labors of Corliss were in the direction of complicating the steam engine, the introduction of the Corliss type of framing was, on the other hand, a simplification. Instead of the old four-bar guide bolted to a bedplate, to which at the forward end was also bolted the main bearing, the bedplate, guide and main bearing were made to form one harmonious whole, whilst the sharp re-entrant angles usual between each part, and the bedplate to which it was bolted, were replaced by easy curves, pleasing to the eye and affording no lodgment for dirt. This principle of reducing the number of projections has in the case of certain builders of large horizontal engines led them to replace the bright hexagon nuts usual on cylinder covers—each requiring to have each one of its six faces polished up separately—with black nuts, and to cover the cylinder head, nuts and all, with a polished false cover secured with flush screws, offering everywhere a perfectly smooth surface to the cleaner's emery cloth and waste.

In some cases, perhaps, this smoothness of outline has been attained only at some sacrifice of accessibility. American engineers, indeed, whilst admitting the neat appearance of a first-class British locomotive, affirm that this is reached only by making it difficult to get at the working parts and by the use of inside cylinders and a cranked axle, to which they have many mechanical objections to urge.

Mr. Patrick Stirling, however, in his famous single-driver express engines, which rank amongst the handsomest locomotives ever built, proved that the neat get-up characteristic of the British practice was readily attainable with outside cylinders. The first of the alleged drawbacks, however, remains, and in general it must be confessed that a neat exterior does usually mean some sacrifice in the matter of accessibility to the working parts. Whether this sacrifice is expedient or not depends upon the special circumstances of the case. Twenty-five years ago it was thought essential that crossheads, crank-pins, and eccentrics should be kept within full view of the engineman if serious damage was to be avoided. The use of soft packings again made it absolutely necessary that there should not only be easy access to each gland, but that this gland should be always in sight, so that the attendant might see by the leakage of steam when to take another turn at the gland nuts. Modern metallic packings, on the other hand, often run for years without attention, and there is therefore no longer any valid objection to placing the stuffing boxes within a closed casing. As regards the principal moving parts, experience with the modern high-speed engines shows that by providing automatic lubrication and by carefully locking all parts liable to work loose, such engines will work continuously for months without requiring adjustment. Some remarkable figures showing the unimportance of accessibility in the case of engines of this kind were given by Mr. J. Davidson, in a paper

FIG. 2.—13-INCH MILL, SHOWING MORGAN CONTINUOUS FURNACE AND ROUGHING MILL AND EDWARDS AUTOMATIC FINISHING TRAIN.

FIG. 3.—CONTINUOUS MORGAN BILLET MILL, DRIVEN BY AN ALLIS-"WORCESTER" TYPE ENGINE.
(Owing to delay in getting tank plate gear shields, a temporary plank shield was used.)

read last year before the Liverpool Engineering Society. Thus, after working five years and making over 535 million revolutions, the crosshead pin of a Willans engine had worn in one part 1-500 inch, and the connecting rod brasses had worn down but 1-50 inch in this period. Quite similar figures have been recorded with Bellis engines; and as showing how successful the modern engineer is in constructing bearings which require practically no adjustment, we may mention the bearings of Parsons' steam turbines, which, although carrying shafts running at some thousands of revolutions per minute, show practically no wear even after some years' use.

A machine or engine with many exposed parts may often be impressive, but can never look neat. Such neatness is, of course, a counsel of perfection, and must be aimed at with discretion, since it is reached by covering up the moving parts of the machine, and this can only be done safely where equal care is taken to avoid the necessity for accessibility as with the engines above named. A similar problem to that solved by the enclosed engine builders has had to be met by the builders of motors for automobiles. Here, indeed, accessibility was not, perhaps, of special importance at any time, since such motors being largely in the care of amateurs, and running at very high speeds, would, if in any way out of adjustment, be likely to wreck themselves before their proprietors discovered that any-

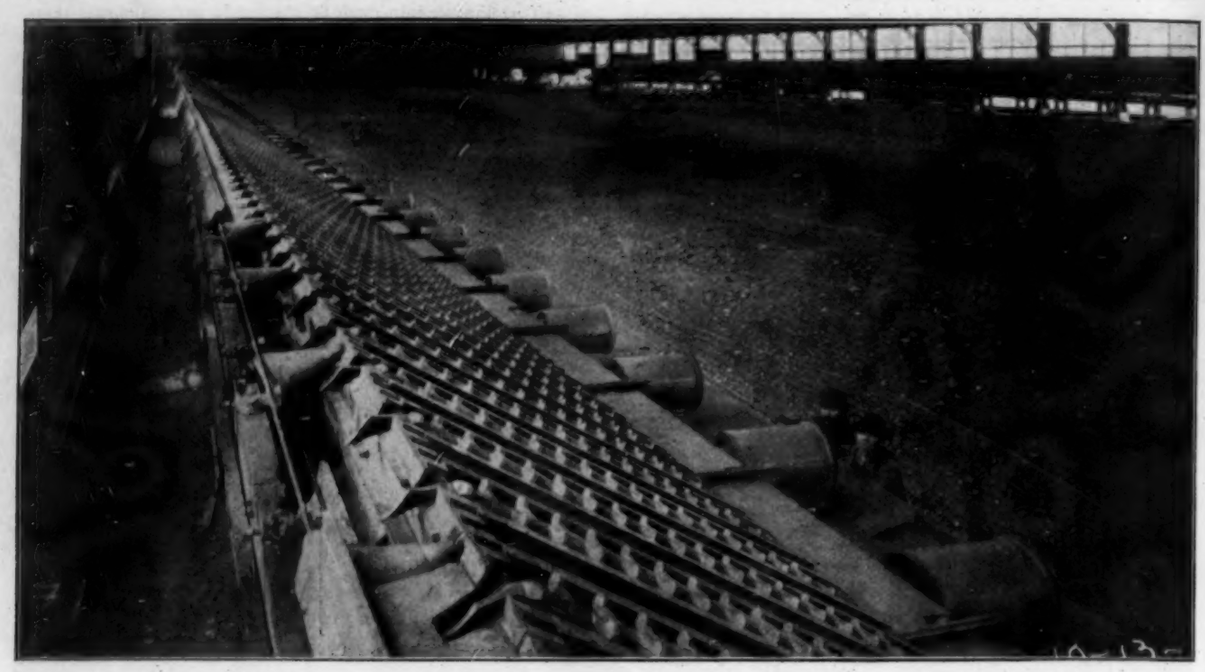


FIG. 4.—THE 450-FT. COOLING BED, SHOWING DETAILS OF CONE ROLL CONVEYOR, LIFTING WINGS AND ESCAPEMENT RACKS.

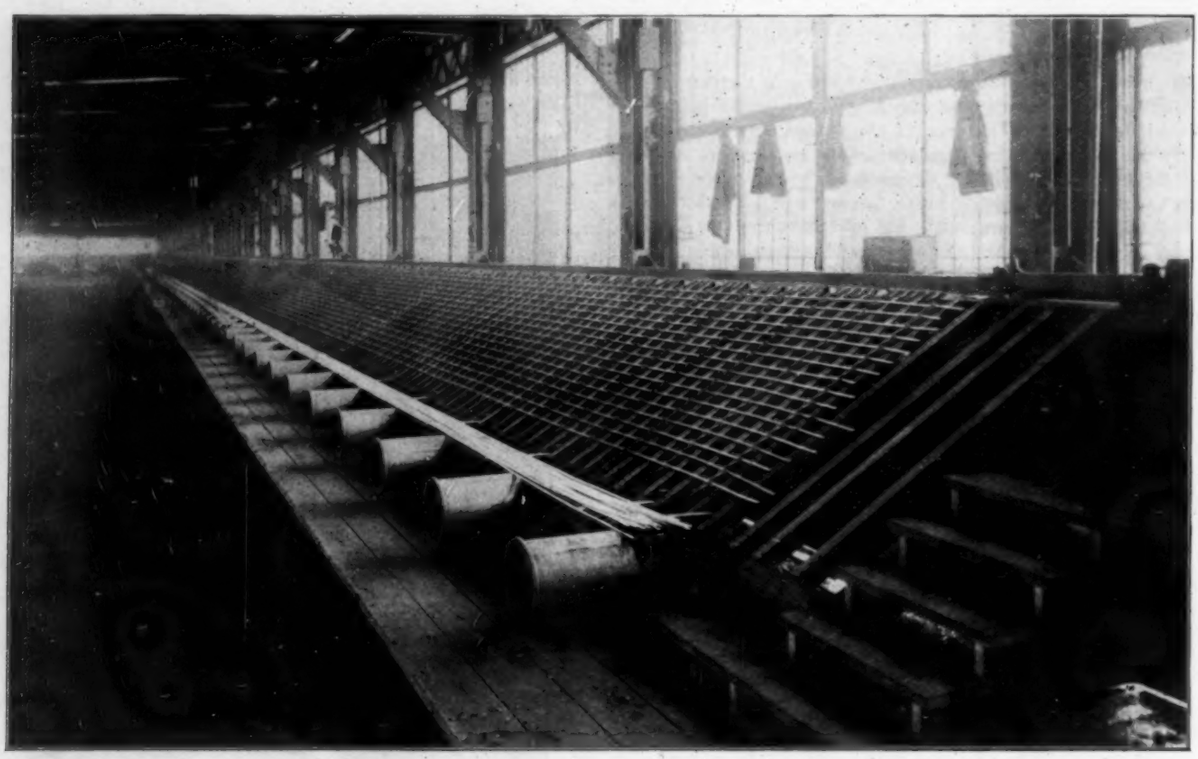


FIG. 5.—THE 450-FT. COOLING BED.

(Grip and cross head of stretcher engine at extreme right. The hot bar can be seen running out under grip links and between the top notches of bed. The gravity bed is full. The assembling table is nearly full. The last end of the bunch being sheared is seen some 60 feet down the table. The shear is too far away to be seen.)

thing had gone wrong. Little extra risk is therefore taken in closing them up, and by attention to the lubricating arrangements, and more especially to the careful securing of all nuts and the like against the possibility of working loose, such

FIG. 6.—40-FT. GAUGE BAR AND SHEAR, SHOWING SKELETON, SCALE POCKETS AND A COUPLE OF BUNDLES READY TO SHIP.

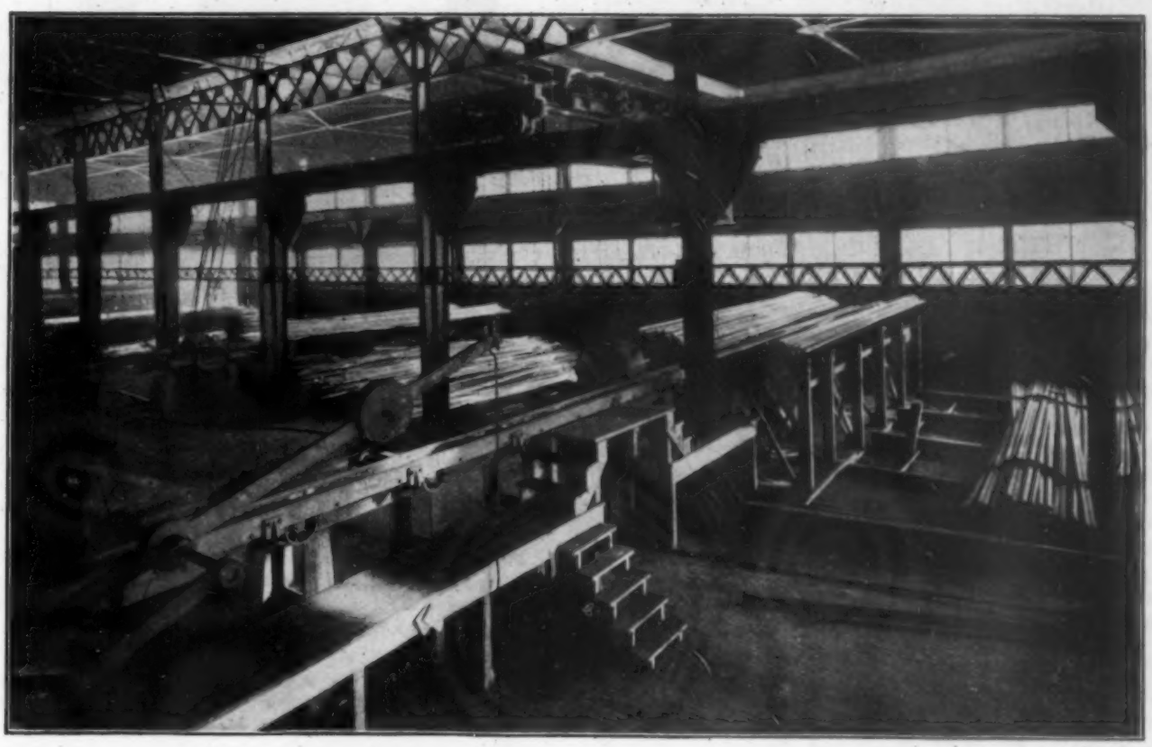


FIG. 7.—BILLET STORAGE, SHOWING BUNDLES OF BILLETS WITH CHAINS LEFT ON. ELEVATED BILLET CRADLES. FURNACE CHARGING ROLL TABLES.

motors now give little trouble, and it is quite on the cards that similar designs will come into general use even for stationary engines. A very remarkable feature about such motors is the high speed at which it is found possible to run them. The

valves are always of the pot-lid type, and with the engines at full speed are raised and let fall in their seats 10 to 20 times a second. This is the more remarkable, since, as shown by Mr. Longridge's reports, with steam engines running at quite moderate speeds, about one-quarter of the breakdowns recorded nowadays are due to the failures of the valves and gearing. The engines concerned are, it is true, mostly of the Corliss type, but these represent the highest pitch of perfection attained

by the old school of designer, whose motto was accessibility; and the fact that the working parts are nevertheless constantly going wrong gives warrant to those who hold that the day of such engines is nearly over, and that the future belongs to the neat but insignificant looking enclosed engine or steam turbine.

No mechanic can fail to admire the skill shown in the design of a high class engine of the Corliss type. In realizing the ingenuity with which inventors have succeeded in attaining to their ideal indicated diagram, he is inclined to forget the complication of the release gear—a complication which it is only just to say, however, by no means leads to heavy wear. He is also inclined to slur over any objections that may be taken to the large number of separate parts which require lubrication and constant supervision if a breakdown is to be avoided, and in the unconscious tribute they bear to man's mastery over gravitation; to openly delight in the massive proportions which the slow speed involved in the use of gears of the type named renders essential. In its day, moreover, the Corliss engine was by far the most economical type of steam motor known; but year by year its once despised rivals have more and more successfully disputed its once unchallenged supremacy in this respect; and if regard is had to effective in place of indicated horsepower, there is reason to believe that the superiority will eventually pass over to certain of its simpler and cheaper competitors, such as the steam turbine, which in the Eberfeld tests was shown to generate a kilowatt with but 18.22 pounds of steam at 255 degrees C., a performance which, so far as we know, constitutes a record. The two types of motor well illustrate the opposite schools of design. In the one the end sought is attained as the result of almost endless elaboration, and the mechanism needed is exceedingly complicated, and requiring most careful design and construction to insure durability. In the other nothing could be less involved than the means employed to obtain as useful work the available energy of the steam. From an æsthetic point of view, grandeur may be said to be the motto of the one school of design, neatness that of the other.

Whilst in the foregoing our remarks have been mainly directed to steam engine practice, the tendency in question is visible in almost all other departments of machine design. Working parts are more and more concealed from view; and though in this the factory inspector has not been without influence, the drift of designers has been independently in evidence, of which the evolution of the Hendey-Norton lathe and its imitators may be instanced as a case in point. Large-power gas engines, it is true, as yet show no signs of the influence of the high-speed enclosed explosion engines now becoming common for special purposes; but progress in mechanics has to a large extent been indicated by a diminution in the mass of moving machinery needed for a given output and an increase in its speed of movement, and there is no reason to doubt that future advances in the construction of gas engines will follow a similar path, and this will lead to the covering up of working parts now commonly exposed to view.—[London Engineering.

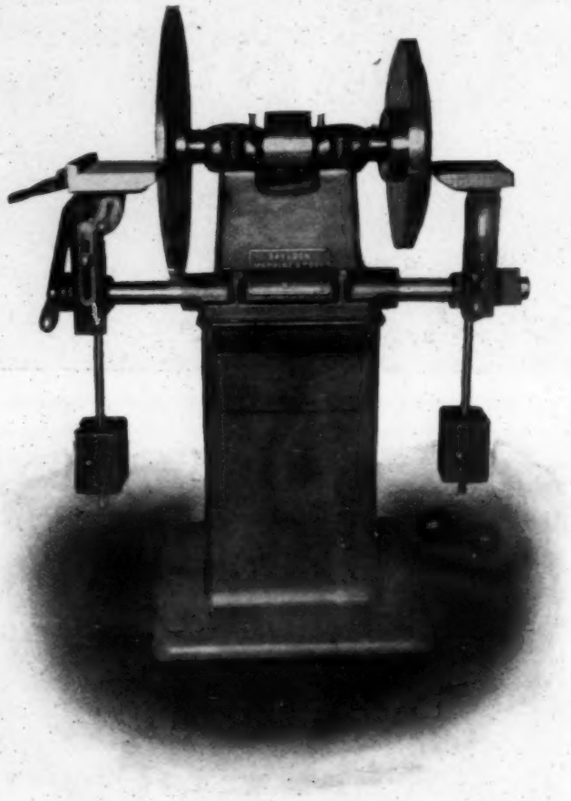
The Syracuse Railroad Construction Co., which is building a 25-mile electric railroad between Auburn and Syracuse, New York, has recently closed a contract with the Westinghouse Electric & Mfg. Co. for two 650-k. w. engine-type alternators, delivering three-phase current at 360 volts and 3,000 alternations; also for five 400-k. w. rotary converters, together with raising and lowering transformers for operating a 15,000-volt transmission line to two sub-stations. A complete switchboard is included and in fact everything for the operation of a complete railway line. The generators are to be direct connected to two 22 and 44x48-inch cross-compound, horizontal, Corliss engines, purchased from Messrs. Westinghouse, Church, Kerr & Co., and built by the Westinghouse Machine Co., of Pittsburg. The engines are to receive steam at 150 pounds, are to run at 100 r. p. m., and are rated at 1,000-h. p. each, with a maximum rating of 1,800-h. p.

A 6-inch Carnegie plate, representing the last group of armor for the battleship Missouri, underwent a successful test at the Indian Head proving ground last week. Three shots were fired and the penetration in each case was only three inches.

THE BAYLDON DISC GRINDER.

A new disc grinder brought out by the Bayldon Machine & Tool Co., of Jersey City, N. J., is shown in the illustration. The machine is equipped with a 23-inch diameter steel disc of the usual type and on the other end of the spindle is a chuck holding a 15-inch ring of solid emery. The speed of the machine is 1,400 rotations per minute, the speed advocated by the manufacturers for a 23-inch disc as well as a 15-inch emery wheel. The combination of disc and emery wheel is an effective one as the maximum part of the work (the roughing down of any castings or cutting off the scale) can be done on the solid wheel with great saving of time and be much less destructive of the paper discs.

The machine, which is known as the No. 7, is provided with a table of new design having a gibbed slide operated by a lever and controlled by a micrometer stop screw. The journals are large and long, of the best bronze, self-aligning and of the dynamo type, self-oiling by means of rings dipping into the reservoir below. The end thrust is sustained by ball bearings and this eliminates the usual reduction in speed whenever



A NEW DISC GRINDER.

heavy pressure is applied to face of disc while grinding.

The spindle is of 20-carbon steel, ground to exact size and the face plate is also finished in this manner whilst in position on the spindle. The journals are adjustable to compensate for wear and are 5 inches long, 1⅝ bore with spiral oil grooves cut from end to end, each journal having two oil rings dipping in the reservoir and bringing up a flood of oil which, flowing through the spiral grooves, ensures profuse and constant lubrication.

The manufacturers announce that in a short time they will be able to furnish a disc grinder having a horizontal disc 23 inches in diameter, to drive from floor or ceiling countershaft. They are also completing designs for a 24-inch lead lap having a surface which will lie in a horzontal plane. This machine is also intended to be driven from either the floor or a ceiling countershaft.

In the United States Circuit court at Pittsburg a bill in equity was filed by the Westinghouse Machine Co. against the Keystone Engineering Co., alleging infringement on a patent for improvements on the operation of gas engines.

The New Westinghouse Foundry at Trafford City, Pa.

The growth of the affiliated Westinghouse industries has been emphasized by the creation of a city and the building of another Westinghouse manufacturing plant. The new industrial center is located about 17 miles east of Pittsburg on the Pennsylvania Railroad and is to be known as Trafford City. Extensive factory sites have been laid out here to provide for the overflow of the several Westinghouse industries, a number of which have already used up all the available building room at their present locations and are still pressed for space. The first of the Westinghouse companies to erect buildings in the new city is the Westinghouse Foundry Co. which is at present putting up the extensive foundry plant and pattern shop described in this article. This addition is necessitated by the rapidly increasing business of the Westinghouse Machine Co., especially in connection with very large steam and gas engines and steam turbines.

In laying out Trafford City provision has been made, not only for the factories that are to be erected there, but also for homes and all modern improvements and comforts for the men who are to work in the factories. The latter will be located on a fairly level tract between the Pennsylvania Railroad and the residence portion of the city, which will be reached from the railway station by a steel viaduct 1,100 feet long. The residence district has been laid out upon hillsides and a generally level plateau, high enough above the factory sites to render it free from smoke and dirt. The city consists of two oblong areas, one of which is about ½ mile by ⅕ mile and the other ½ mile by 1/7 mile, the two areas meeting in such a way as to form a reversed letter "L," the corner of which is the most northerly part. The town has been laid off into about 800 building lots, each with an average frontage of about 30 ft., and a depth of 100 ft. In addition to this, space has been left for six parks. The entire town has been provided with waterworks and sewerage systems, the latter including separate storm water and sanitary sewers. This work, as well as the paving of the streets, was completed before the city was thrown open to settlement. The latter event, which took place on June 7, 1902, recalled in many ways the famous booms of the far West. Many of the intending purchasers of the lots came to the site of the future city a day before the sale was to commence and "squatted" on the ground which they wished to possess.

The new town is connected with Pittsburg by the Pennsylvania Railroad, over which there are 46 local passenger trains going each way daily and reaching the center of the city in from 25 to 35 minutes. In addition a street railway line has been built, connecting with the Pittsburg Railways Co.'s line at Wilmerding, 2 ½miles distant. This street railway passes over the street viaduct into Trafford City and forms a loop through the principal streets.

The factory site, located in a bend of Turtle Creek, provides room for nine factory buildings, each about 200 ft. by 800 ft. A system of railway yards and tracks serving this area has been laid out in a very thorough manner, providing a track alongside of each building and transversely through each end. The storage tracks, in connection with this, occupy an area of about 300 ft. by 200 ft. This system of tracks is connected with the main line of the Pennsylvania Railroad by the Turtle Creek Valley branch of the latter. It is also to be connected with the towns of Wilmerding and East Pittsburg, where the works of the Westinghouse Air Brake Co., the Westinghouse Electric & Mfg. Co., and the Westinghouse Machine Co. are located, by an inter-works railway which will be operated by the Westinghouse interests.

The new foundry and pattern shop of the Westinghouse Foundry Co., are located at the extreme southern portion of the factory site and near the steel viaduct mentioned above. The pattern shop and storage building, which has already progressed well toward completion, is a steel and brick structure 605 ft. long and 80 ft. wide, with a height to the eaves of the roof of 47 ft. The pattern shop occupies 160 ft. at one end of this building. It is divided into two floors, the second floor being suspended from the roof trusses in order that the first story may be entirely free from columns, thus providing ample

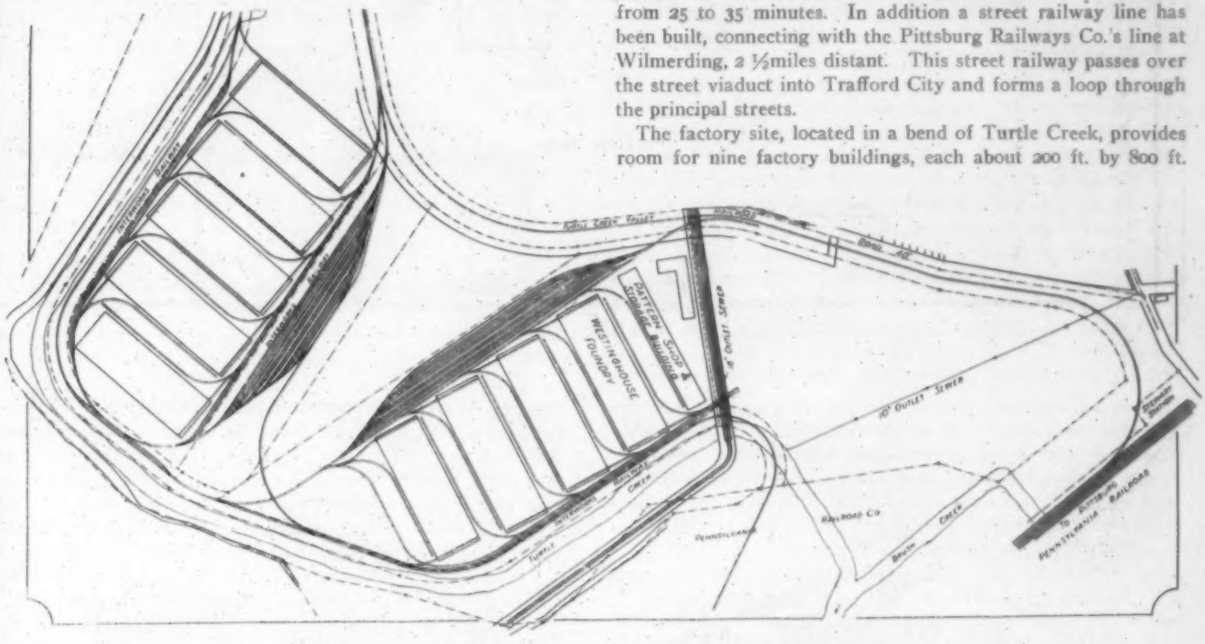


FIG. 1.—MAP OF NEW WESTINGHOUSE PLANT AT TRAFFORD CITY, PA.

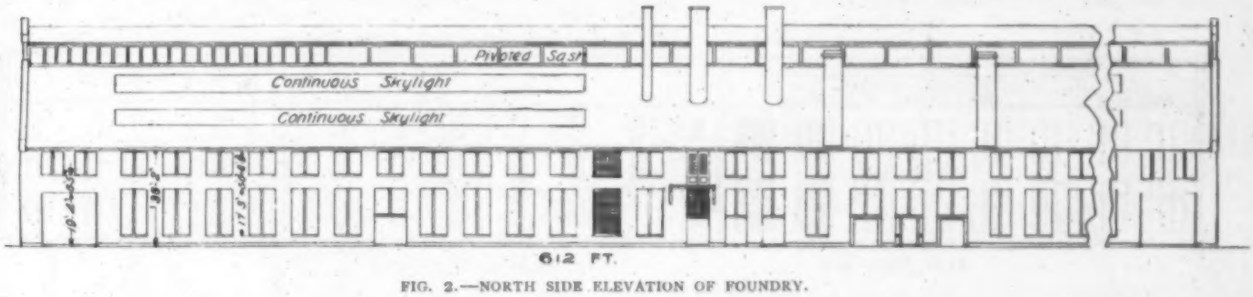


FIG. 2.—NORTH SIDE ELEVATION OF FOUNDRY.

space for handling the largest patterns. The remaining 447 ft. of the building is to be used for the storage of patterns and has three floors, the two upper floors being supported on steel columns and the entire space being divided by interior fire walls into three separate compartments. The foundations are of concrete and the superstructure of steel and brick. The foundation of the ground floor is made up of 8 inches of concrete into which the floor sleepers are bedded and on top of these is a layer of 2-inch maple flooring. The upper floors in both the pattern shop and storage building are supported on steel beams and steel girders, and are made up of 3-inch yellow pine flooring covered by one thickness of maple flooring. The roof purlins are steel I-beams spaced 8 feet center to center, and covered with 3-inch roof sheeting which is covered with slate.

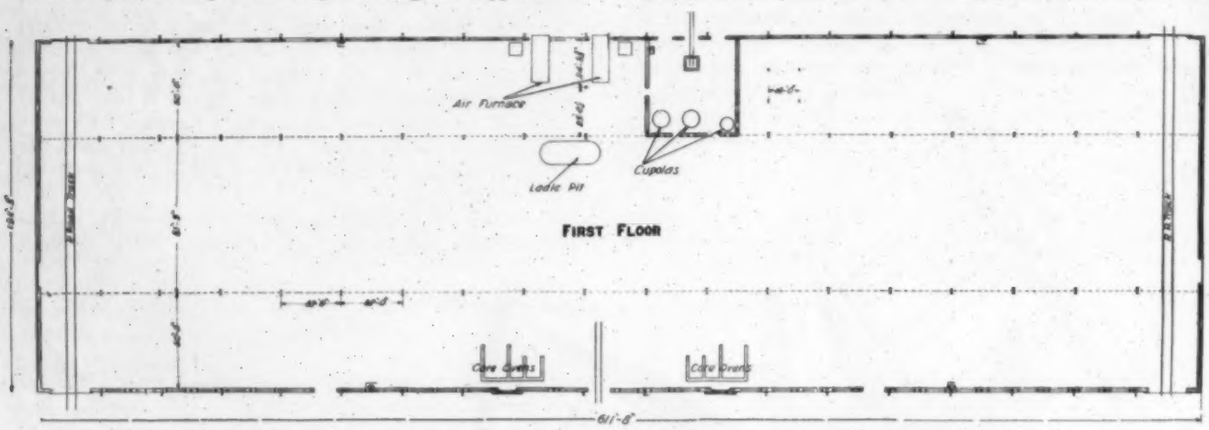


FIG. 3.—PLAN OF FOUNDRY.

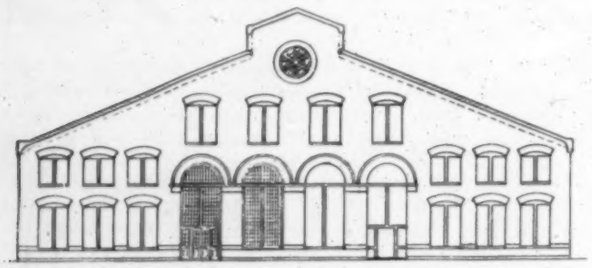


FIG. 4.—ELEVATION OF EAST AND WEST ENDS OF FOUNDRY.

The foundry building is 611 ft. 8 in. long and 184 ft. 3-in. wide outside of the brick walls, which are 36 ft. high at the eaves and 80 ft. at the peak. As in the case of the pattern shop, the foundations are built of concrete and the superstructure of steel and brick. The foundry is divided transversely into three bays, the center bay being 80 ft. 3 in. wide between centers of columns, runways being provided for traveling cranes of 80-ft. span and 150 tons lifting capacity. The cranes will be electrically driven. The two side bays are each 50 ft. 6 in. wide from center to center of columns and are provided with runways for traveling cranes of 47 ft. 2½ in. span and 50 tons lifting capacity. At one side of the foundry building runways are provided for yard traveling cranes of 100-ft. span and a lifting capacity of 75 tons. The I-beam purlins are spaced 8 ft. center and center and are covered with 3-in. yellow pine roof sheeting. The roof is covered with slate.

At the middle of one of the side bays, where the cupolas are located, is a charging floor about 50 ft. square, constructed entirely of steel. The melting equipment of the foundry will consist of two air furnaces, each having a capacity of 30 tons, and three cupolas capable of melting 18 tons per hour each. This will enable a casting weighing as much as 100 tons to be easily poured and the casting can afterwards be lifted out of the sand by one of the 150-ton traveling cranes. The air furnaces will be employed for the largest and most important castings, owing to the fact that they yield a superior iron, and the cupolas will be employed for the ordinary classes of castings, and particularly small castings. The building will contain every modern foundry convenience, making possible the easy and economical handling of all materials, and it is expected to produce such castings as those required for the largest size of steam engines now in existence, with provision for possible increase in sizes for the future. Both buildings will be provided with automatic sprinklers for fire protection.

The buildings will be equipped with modern lavatories and conveniences for the comfort of workmen and will be in every respect up-to-date. They will be heated by hot air, the foundry, pattern shop and pattern storage rooms to have minimum temperature of 50, 60 and 35 degrees Fahr., respectively, in zero weather. Artificial light will be furnished by both arc and incandescent lamps. In order to insure plenty of light during the day, the windows are large and both the foundry building and pattern shop are provided with sky-lights of large area. The plans for the buildings were prepared under the supervision of the Westinghouse Machine Co. The Security Investment Co., of Pittsburg, Pa., is the financial agent and general contractor for the entire works, and Messrs. James Stewart & Co., of St. Louis, Mo., and Pittsburg, Pa., are the managers of construction.

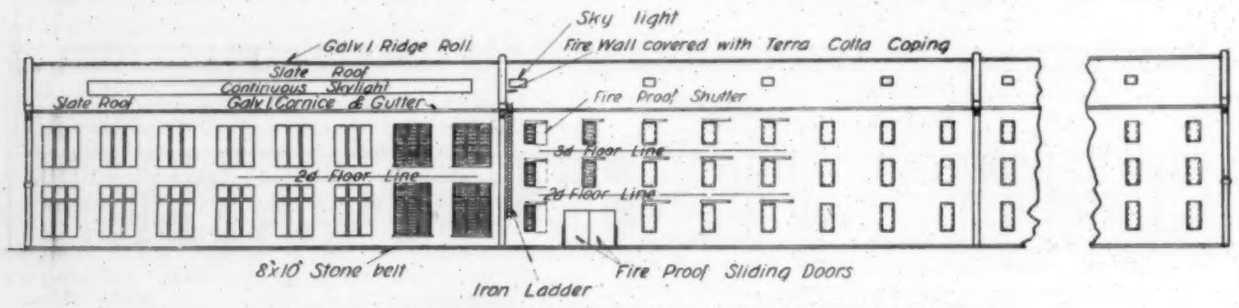


FIG. 5.—NORTH SIDE ELEVATION OF PATTERN SHOP AND STORAGE. LENGTH 605 FT.

The National Machine Co., of 660-662 Washington St., Milwaukee, manufactures a speed lathe which has made a good record. This lathe is made in 4 ft., 5-ft. and 6-ft. lengths with plain, combination and set-over tailstocks. The best material is employed and the machine is the product of skilled workmen. The company also does general machine erecting and repairing and is prepared to build gas and gasoline engines. Theo. G. Mueller is president; Edward C. Mueller, vice president and manager, and Chas. J. Kaiser, secretary and treasurer.

SUGGESTED AT THE SHOP.

BY F. O. REMAN.

The machine shop of today has been shorn of many of the legacies of the past. The interchangeable requirement has broadened the scope of operations and the ancient procedure is now cast aside on the score of economy. The construction of a single machine, from the ground up, was once the regular order of events and each machine was a law unto itself. Building in quantities brought about a new atmosphere in which the old methods could not thrive. They were discarded as the plan of making the machine parts interchangeable was adopted. From that time on has seen the decay of the hand operation; the day of the file, the cold chisel and the hand

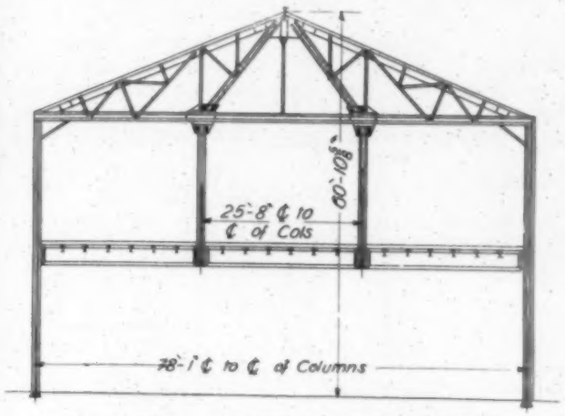


FIG. 6.—CROSS SECTION THROUGH PATTERN SHOP,

hammer is waning fast. This, too, in an age which glories in the hand made article, pays high prices for it and then—hustles around for a machine to make the thing by the million. Today the hallway is decorated with a spinning wheel, but in some back room you will find a sewing machine. Just the same I honestly believe that the joy of the hand-made article is something more than a fad. It is a recognition of the personal element, the individuality of the craftsman who with a more liberal time allowance stamps a unique character upon his product. For many reasons this sort of work is not considered practicable in the modern factory.

* * * * *

But the thing comes to the surface once in a while, nevertheless. I have known one manager at least who claimed that no

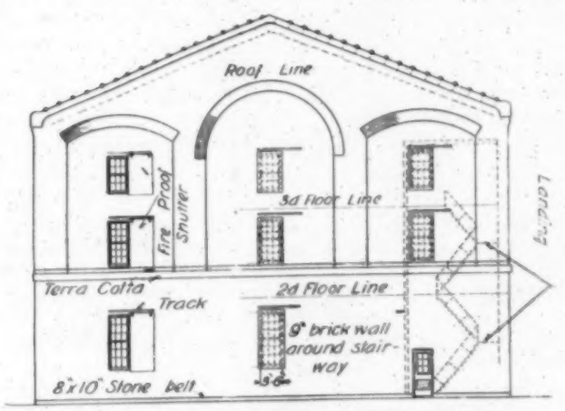


FIG. 7.—EAST END ELEVATION OF PATTERN STORAGE.

apprentice had learned his trade unless he had made some of the small tools. He put the boys at work making taps, reamers, etc., and paid no attention to the fact that he could have bought an equally good and much less expensive supply than the slow and laborious production of his careful craftsmen. The scheme probably paid good interest all round for the making of these things is nothing of a snap from the cutting up of the stock to the final polish on the shank—through the work of centering, turning, threading, milling and tempering. It formed part of the tool room experience that every machinist should have and came back to the firm in the shape of a better equipped force of workmen. This training of the workmen along lines laid down when shop practice was essentially different is still followed to a very limited extent by a well known engine company. There is a place on the pillow blocks of this make of engine which is still finished with the aid of the hand hammer and cold chisel. Not because of the superiority of the workmanship when done in this manner, but solely as a matter of skill—a continuation, if not indeed a revival, of the time when the hand, heart and head were in close combination or supposed to be at least.

* * * * *

The same idea crops out in plants where the powers that be grudge the cost of some new tool or other equipment. The foreman of fertile mind has often met such a refusal with resource—made the thing desired out of a fair supply of native ability and a *little* stolen spare time. Herein he followed the route blazed by the man who sold his out-of-date and unused equipment to buy a much needed engine and then reported that he had made it out of scrap. The aforesaid scrap heap with its half finished odds and ends—never a decent beginning—has given birth to many of these sorely wanted appliances. A centering device, a press, a small drilling machine and the like, something a trifle more complicated than a centerpunch and not quite so hefty as a lathe, is often a hard thing to get through the office if there is a varied collection of scrap in the way. The handy man who can run his lathe on regular work and at the same time has leisure for a few other things then gets into gear and with a little aid from the tool maker and the foreman a new machine is rushed to a finish.

* * * * *

Probably it has been a good job for all hands that the machine was made at home even if one has doubts about the cost keeping. "It cost nothing and is just as good. Better in fact than the one over at Smith's." The advantage of a change in the routine of plain, every day work is not appreciated as much as it should be. The difference between the performance of what may have become nothing more than a humdrum repetition and getting out something which must go into shop service and stand the stress of use and criticism of no gentle type is one of extreme range and the swing of the pendulum from one to the other amounts to genuine recreation. This sort of tonic tends to strengthen and increase the shop capacity at weak points and is valuable for forty-odd reasons. The workman does a quick job that will stand fire. No selfrespecting mechanic aims at any other and this one being for home use will keep in plain sight and all blemishes stand out as big as a house; the shop equipment is increased for the general good, and the foreman has got something that the office could not afford and gets it at a bargain counter sale at that.

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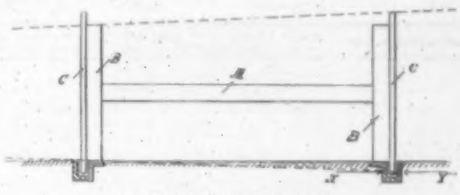
I find an instance of this sort in a shop of my acquaintance which sadly needed an industrial railway. After some tribulation one was obtained. The job is a good example of what



A HOME-MADE RAILWAY.

may be done by men who have had no railway experience but have instead—and this is the main thing—a lively knowledge of machine shop requirements. The track is no crude affair at that, even if it is home made, and the cars and rails are well designed, neat and strong, as is seemly in a modern machine shop. The upper surface of the rails sets flush with the floor and this advantage is a very valuable one. Simplicity being the strong point of the system as originally projected, the railway is not complicated by switches. The designers held the opinion that for ordinary shop purposes such refinements were unnecessary. The lack of switches does not appear in practice to render the arrangement awkward and the handling of the cars seems to be an easy task. Of course, a good share of the convenience of the method may be set down to the quality of the workmanship. The car wheels, bearings, etc.,

are finished in the style that has for many years advertised the other products of the plant. The design is the main thing, however, and the rough sketch illustrates all that is absolutely necessary in telling the tale to a mechanic. Here the axle A has the car wheels attached as shown, the tread of each wheel resting at B B, on that part of the rail which is set flush with the floor. On straight lengths of track this is of course all that is required for smooth running, the wheel flanges C C extending into the grooves. When reaching a curve in the track, however, the car wheels would bind awkwardly in following the natural tendency to continue in a straight line, along a tangent to the curve rather than the circumference of the circle. At these places the grooves in the rails on the outer curve of the circular track are made shallow as indicated by the line at X - - - - Y. The outer wheels then rest on the rim of the flange and each axle and pair of wheels turn as though the combination formed the frustrum of a cone. This is illustraed by the dotted lines which converge to the left and of course the car wheels then travel on portions of their circumference proportionate to the varying lengths of the two arcs of the track, the inner or the outer curve.

* * * * *

The wheels and cars move very smoothly in use and the arrangement is claimed to have had the additional advantage of having cost but a relatively small amount. The expense of manufacture and installation being about 50 percent less than

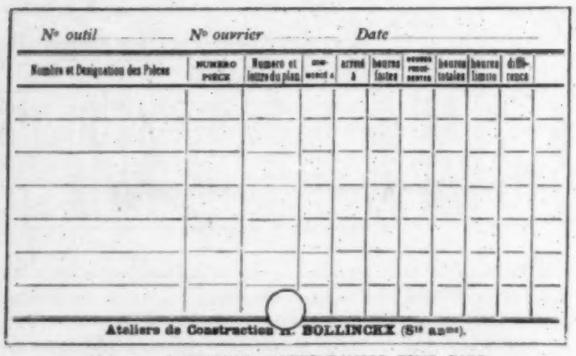


FIG. 2.—A BELGIAN MACHINE SHOP TIME CARD.

was quoted by a maker of such equipment. I don't doubt the good faith of that statement for an instant. Not much. But the circumstances should all be considered before shops generally start out to make their equipment in preference to purchasing elsewhere. I would not draw any parallel between a case of this kind and the hoary headed story about the workman who was not fettered by lack of drawings and made two patterns out of his head with enough lumber left for another one. Much depends upon the point of view and sometimes I have known the general good to be conserved by the doing of a piece of work that was not manufacturing at all. The stock of self reliance, skill and shop sagacity has been increased by just this sort of thing, not to speak of the substantial addition to the other means of production. But the cost—ah, there's the rub. Where all hands gladly turn to and make the scheme a success regardless of the difficulties in the way it is really doubtful if the cost can ever be known but the advantages are too evident to cavil about, anyway.

A BELGIAN SHOP TREE AND SHOP CARD.

A staff organization diagram showing the arrangement and connection of the different elements of the working force employed at the plant of the Bickford Drill & Tool Co. at Cincinnati, was published in *The Iron Trade Review* of Oct. 3, 1901. This diagram, or shop tree, attracted the attention of Arthur Bollinckx, of the well known firm of engineers at Brussels, Belgium, who has favored us with a copy of the shop tree used in his plant. This diagram is reproduced herewith and is an interesting example of shop organization.

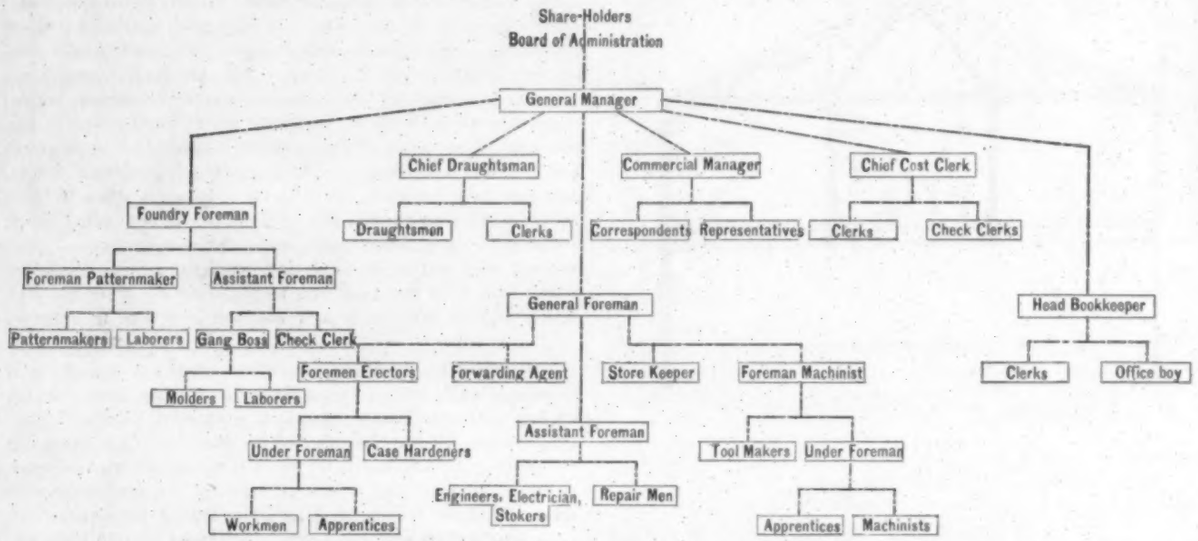


FIG. 1.—THE STAFF ORGANIZATION OF A BELGIAN PLANT.

In the letter of transmittal is enclosed a copy of the time card used in the Brussels plant. The card is 3x5 inches, bearing the name and number of the pieces on which work is being done, number of the machine and the workman, number and symbol of the drawing, when work commenced and stopped, time worked, previous time record, total number of hours, the time limit and the difference between the time limitation and the total hours required to complete the work. The items are arranged in columns, the number of the machine and the workman being placed on the top line with the date. These cards are filled out daily in order to ascertain the working cost and as will be seen the firm has inaugurated the premium system well known in this country. Mr. Bollinckx points out in his letter that the firm follows the plan of making parts interchangeable with a liberal use of standard gauges and that the pieces are supplied to the erecting department from a storeroom, a system that necessitates close work and progressive management.

The Belgian firm has the title of the company arranged as follows: "Ateliers de Construction, H. Bollinckx, Société Anonyme," the latter portion signifying that it is a joint stock organization represented as capital by a certain number of shares called "actions." The affairs are in the control of a number of directors, five in this instance, who meet at least four times a year and oftener if there are any urgent matters to be discussed. One of these members of the council of administration is delegated to act for the others as a managing director and is known as the "administrateur délégué." He has charge as works manager and has the practical administration of affairs and must sign all documents, to which usually the name of the bookkeeper is attached. The family tree of such a company really begins with the shareholders whose designation should therefore precede the "administrateurs."

A NOVEL DRILL CHUCK.

It is a somewhat peculiar thing that while machine tool designers have found it necessary to equip automatic screw machinery with mechanism for speedily getting work into and out of chucks there has been so little progress made in the adaptation of similar conveniences to chucking facilities on other machine tools. The turret tool manufacturers have found it advisable to make arrangements so that the changes in feeds and work should be handled with the least possible delay and the positive gearing of both lathes and milling machines is now constructed that the feed ratio may be altered at pleasure without stopping the machine. Chucks in themselves have undergone but few changes and these, except in the rare instances mentioned, have not involved any radical alteration either in the general design or operation. Chucks consist in the main of a set of movable jaws capable of being adjusted to grip a drill or other piece. The jaws may be manipulated through a series of independent or combination screws by means of a wrench, or part of the chuck may be knurled to allow of being firmly held by the hand and tightened in that

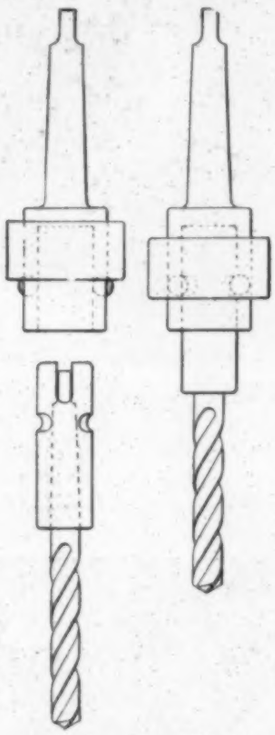


FIG. 1. Collet Released from Chuck.

FIG. 2. Collet Locked in Chuck.

manner. In either case the majority of chucks demand that the machine shall be at rest when the change in work is made and most mechanics will have a lively recollection of either trying with more or less uneasiness to insert a wrench into the socket before the spindle stopped or seeing a wrench cause some unpleasantness—to put the case mildly—by being left to whirl for a limited time with the chuck after the spindle had started up, a limited time being all sufficient to catch a jumper or throw several ounces (or pounds) of wrench where it would do the least amount of good.

A drill chuck recently designed by the Seneca Falls Mfg. Co., of Seneca Falls, N. Y., is a refreshing novelty and supplies a method of putting a drill into the machine and holding it there until it becomes necessary to make another change, without waste of time by stopping the spindle. The tool has been patented by A. S. Davis of that company and it may be pointed out that it is not limited to use in the spindle of upright drills, as might be supposed from a casual examination of the construction, but is equally applicable to the easy and rapid change of drills, reamers, counterbores, taps, etc., in lathes and other horizontal spindle machines, without stopping the machinery. The chuck consists of a shank of the well known form fitted to the taper hole in the machine spindle. This is illustrated in the upper part of Figs. 1 and 2. In the lower portion of this shank a hole is bored concentric with the taper and the resulting shell has a couple of holes drilled diametrically opposite each other for the reception of steel balls, one on each side, as shown by the dotted lines. The balls cannot fall into the socket because the holes are of smaller diameter at their inner ends and thus the spheres are only allowed to project inward about one-third of their diameter. A locking ring fits loosely on the outside of the shell and is permitted to slide a short distance up or down, the distance being limited by a blind screw which fits a threaded hole in the collar and projects through to be held by the edges of a groove turned in the shell. This groove extends entirely around the shell and the collar or retaining ring may be caught and held at pleasure whilst the shank is turning with the spindle of the machine. In Fig. 1 the locking ring is held at the highest point and the balls which have a diameter greater than the thickness of the shell are easily moved outward as the collet is pushed into the socket. The collet, as shown by the lower portion of Fig. 1, has a pair of grooves in its circumference matching with the balls, and when the parts are in position the locking ring is pushed over the balls forcing them into the collet grooves so

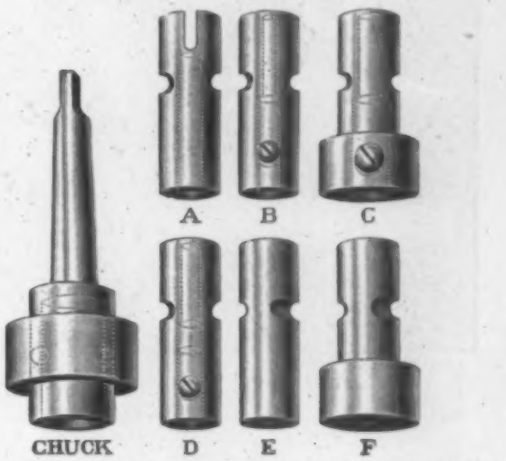


FIG. 3.—CHUCK WITH VARIOUS STYLES OF COLLETS AND COLLET BLANKS THAT CAN BE USED.

that the drill is positively driven at once. There is no shock to the operator at the moment of engagement, as the ring is still free to turn after the balls are held within their respective grooves.

To change the collets it is only necessary to raise the locking ring which instantly releases the balls, allowing the collet to drop out and another may be inserted. By dropping the locking ring to its former position the balls again roll into place ready for drilling operations at once. It is claimed, and the statement seems quite reasonable, that owing to the peculiar construction of this chuck collets can be conveniently and safely changed at the highest speed, as there is nothing to catch and endanger the operator.

The Bourne-Fuller Co., of Cleveland, reports that with the additional cutting off machinery just installed, it is able to ship immediately structural shapes from its yards. The company has heretofore been rather handicapped, owing to the delay in setting up this equipment, but is now in better shape than ever to handle orders requiring prompt attention.

The output of the furnaces of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., during the month of August amounted to 28,000 tons. There were only six furnaces in operation throughout last month, but as the seventh was blown in early this month the ouput for September is expected to reach 32,000 tons.

The Rising Fawn Furnace, located at Rising Fawn, Tenn., has been sold to R. C. Crawford and George G. Crawford, of Pittsburg; A. P. McClure, of Birmingham, Ala., and J. D. Larimer, of Lebanon, Pa. The furnace has been out of blast for some time, but as soon as it is relined and repairs are made it will be blown in again.

MAGNETIC CLUTCH DRIVES ON MACHINE TOOLS.

Illustrations are given herewith of the magnetic clutch drives on several planers and shapers at the works of the Wellman-Seaver-Morgan Engineering Co., Cleveland. The following tools are driven with magnetic clutches: One 96x96-inch Niles planer, one 72x78-inch Detrick & Harvey open side planer, one 48x48-inch and three 36x36-inch Pond planers and two 26-inch Cincinnati shapers, all of these clutch drives having been designed and built by the Electric Controller & Supply Co., of Cleveland. These tools have been in operation since April 1 of this year and for the most part have been worked on both day and night turn. Their operation has proved entirely satisfactory.

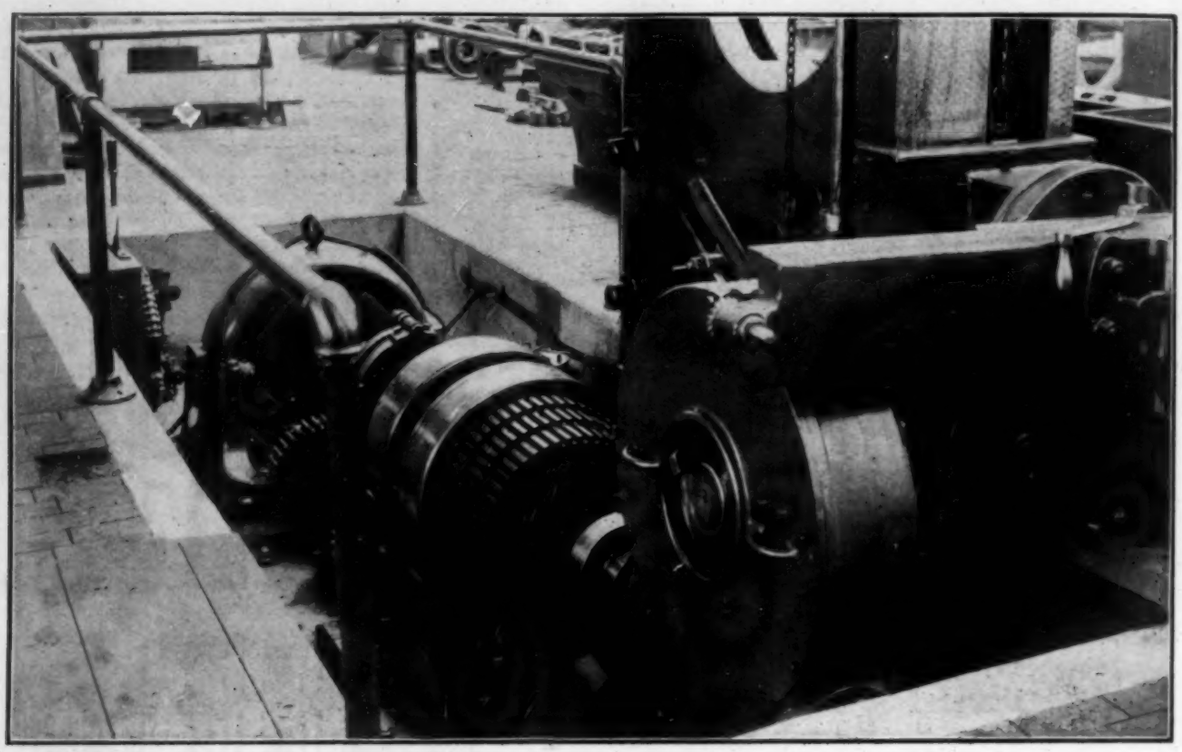


FIG. 1.—MAGNETIC CLUTCH APPLIED TO A 96 X 96 INCH NILES PLANER.

While this form of drive is not entirely new, the operation of these clutches appears to mark a distinct advance in magnetic clutch design. Residual magnetism has been known to impair the satisfactory operation of clutches by causing the clutch to remain in engagement after the magnetizing current was removed, thus making it impossible to stop the motion of the planer table without stopping the driving motor and also rendering the reversal of motion rather sluggish. In the clutches in question this feature has been entirely overcome. By opening the clutch circuits the motion of the table may be

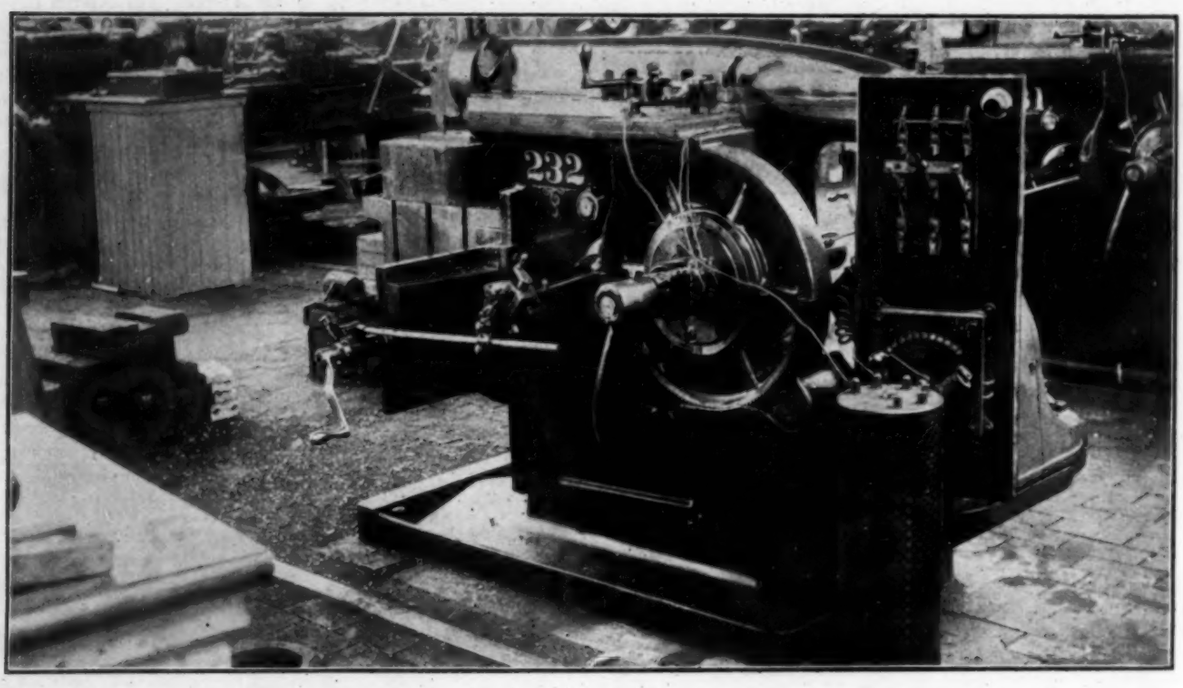


FIG. 2.—MAGNETIC CLUTCH ON A 26-INCH CINCINNATI SHAPER.

instantly stopped even though the driving motor continues to run at full speed. The reversal is found to be fully as rapid as with the best form of belt drive. The table is reversed within 1-32-inch of the same position at each stroke and in many cases pieces have been machined on these planers on which the clearance for the tool did not exceed ⅛-inch. The clutches are quiet in operation, the familiar "squeal" due to the slipping of belts incident to the reversal of large belt driven planers being absent. A number of switches are provided at convenient intervals along the bed of the planer and so arranged that by opening any one of them the motion of the table may be instantly stopped and may be again started by closing the switch. By manipulation of any one of these switches the table may be moved forward or backward 1-16-inch at a time if necessary. This gives flexibility to the operation of the planer for example and is particularly desirable on machines of large size, such as the 72x78-inch open side planer, where the requirements of large work make it necessary that the operator frequently leave his position at the cross-rail.

The current required by the clutches seems trifling when it is known that the clutches on the 96x96-inch Niles planer which transmit 40 h. p. normally and are capable of transmitting 150

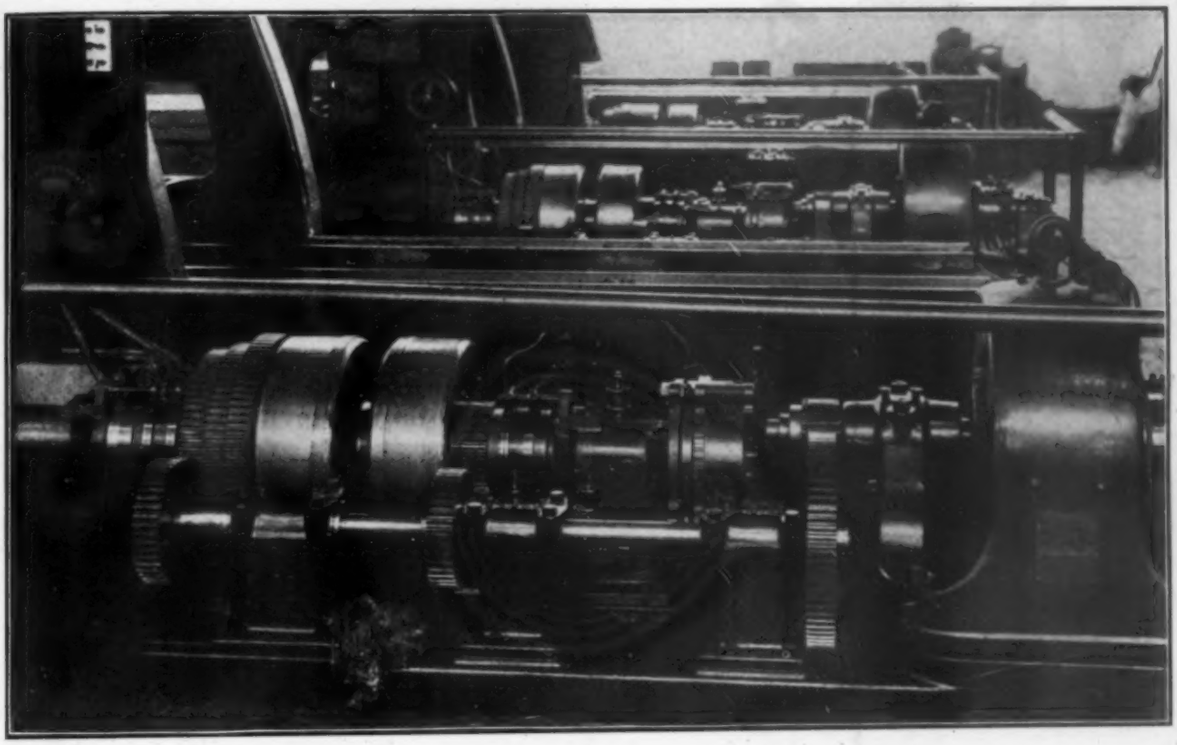


FIG. 3.—36 X 36-INCH POND PLANERS EQUIPPED WITH MAGNETIC CLUTCHES.

h. p. require but 3-10 of an ampere at 110 volts, or less current than is taken by one 16 c. p. incandescant lamp.

All tests so far made indicate that the magnetic clutch drive of planers is more economical of power than the belt drive. This is doubtless due to the fact that the only part of the high speed driving mechanism which is reversed is the keeper plate between the clutches, which is light in weight, while the clutch magnets, which are necessarily of considerable size and weight, run continuously in one direction and at the instant of reversal render available a considerable surplus of power due to their flywheel action.

The use of magnetic clutches is not confined to the operation of planers and other machine tools, but they are being employed increasingly in other fields heretofore occupied exclusively by jaw and friction clutches. The Electric Controller & Supply Co. now has in hand a single order for 32 of these clutches.

The foundry of the Novelty Iron Co., Canton, O., which was erected to take the place of the plant destroyed by fire last March has been completed and the first cast will be made shortly. It contains two cupolas and will have a melting capacity of 35 tons daily.

OBITUARY.

James Murray Scott, aged 22 years, assistant superintendent of the blast furnace plant at the Edgar Thomson Works of the Carnegie Steel Co., died at Pittsburg Sept. 25. He was the son of James Scott, superintendent of the Lucy Furnaces of the Carnegie Steel Co., and the Isabella furnaces of the American Steel Hoop Co. He received his technical education at the Boston Technical School.

Joseph E. Porter, head of the J. E. Porter Co., of Ottawa, Ill., died Sunday, Sept. 21, at his home in Chicago, aged 73 years. He was the inventor of numerous farming implements and was one of the promoters of the Inland Steel Co., of Chicago Heights, and a large stockholder in the same. He was in failing health the last three years and traveled extensively to regain his health. He is survived by his wife and eight children.

George Henry Twichell, until recently sales manager in the foundry department of the American Grass Twine Co., St. Paul, Minn., died at his home at Hastings, Minn., August 22, following an operation for appendicitis. Mr. Twichell was taken ill in Chicago one week preceding his death. Mr. Twichell's death will be mourned not only by many business associates and friends in the Twin Cities and Hastings, but by many in the foundry trade throughout the country. In his death a bright and promising business career was cut short. He was only 27 years old at his death and had spent ten years in the iron and foundry business, having begun as estimate clerk when seventeen years old with the Gillette-Herzog Mfg. Co., Minneapolis. This position he held until 1898, when he was appointed sales manager of the Minnesota Malleable Iron Co., a company formed by the Messrs. Gillette. On Oct. 1, 1901, he entered the employ of the American Grass Twine Co., in charge of their malleable department at Hazel Park, St. Paul. On June 15 of the present year he was sent by the company to Chicago to take charge of their new branch office. The burial was in the family plot at Hastings, Aug. 25. Officers and heads of departments of the American Grass Twine Co. attended the funeral in a body. Representatives were also present from the American Bridge Co., Minneapolis, successors to the Gillette-Herzog Mfg. Co. Mr. Twichell was unmarried and is survived by his father and mother, a sister and a brother.

The Battle Creek Iron Works Co., Ltd., of Battle Creek, Mich., expects to occupy its new shops by Nov. 1.

PORT HURON AIR-MOTOR HOISTS.

The new design of the Port Huron Air Tool Co.'s 1-ton motor hoist is represented in the halftone, Fig. 1. It will be seen that the operating lever acts on two cam surfaces at the upper end of a short vertical shaft which works in a bearing located in the middle of the motor casing. This vertical shaft is pressed upward by a spring and normally tends to return the operating lever to a position in which the air is shut off from the cylinders, irrespective of the direction in which the hoist is moving. The contrivance compels the operator to stand by the throttle while handling the machine, the moment he releases the chain, and the spring forces the cam surfaces together and the throttle is instantly closed. The designer has thus prevented any waste of air and has also by the same agency introduced a safety device which compels the attendant at the crane to pay proper regard to the business in

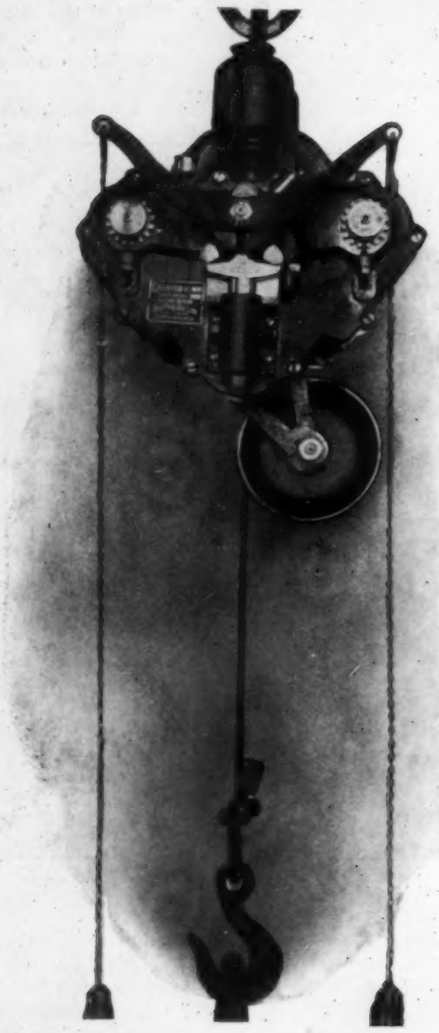


FIG. 1.—NEW DESIGN OF THE PORT HURON AIR TOOL CO.'S ONE-TON MOTOR HOIST.

hand. The two adjustment nuts connected to the motors have been arranged so that any ordinary machinist can take up the tension on the spring which maintains the valve in contact with the seat. A regulation of this tension will not, however, be required until the tension has been taken out of the spring by considerable wear.

There is but a single winding strand shown in the hoist illustrated. This particular machine was intended for use in a shop where rapidity of lift was preferable to using the full lifting capacity at a slower speed, and it will therefore be understood that only half of the capacity of the machine can be handled at twice the speed as by using a double strand; in other words the machine will hoist twice as quickly with a single strand as with a double one.

An ingenious application of this system of driving hoists is shown in Fig. 2. This is a 25-foot boom, and 20-foot post, 10-ton steel jib crane which is actuated by compressed air for lifting as well as the traverse of the load. The builders have endeavored to carry out their purpose of producing a complete and well braced machine of a thoroughly substantial character and everything about the crane is either cast or rolled steel. The gears are all cut and the crane pedestal is fitted with roller bearings, the latter qualification also applying to the upper bearing of the crane as well as the carriage. The lower hook is fitted with ball bearings. The motor hoist is located at a convenient height from the ground where the operator can manipulate it with ease. The upper motor is handled by chains which hang within easy reach of the workman at the hoisting motor. These air motors are capable of lifting the load, having the hose disconnected, and will then retain the load in position indefinitely without any other mechanical brake. The wire rope used on these cranes is what the company terms flattened (not flat) strand. The construction is intended to avoid the wear and tear on a few of the strands, giving a smooth action and producing an even wear on the circumference of the wire.

The builder of these recent improvements in air tools, the Port Huron Air Tool Co., Ltd., of Port Huron, Mich., furnished five air cranes for the new addition of the Detroit Steel Casting Co.

"The Manual of Business."

To the series of *American Artisan* manuals a very useful addition has been made in the new work compiled by Sidney P. Johnston. The book, which contains 263 5x7½ pages, is designed to be a ready reference work for the desk of the man requiring a guide to the numerous forms employed in business and correspondence. A considerable portion of the work contains purely elementary information, but the compiler has gathered the data with evident judgment and his comments are as a rule of a most useful character and scope. Particularly does this refer to the chapters entitled "Debts and Collections," "Banking," "Commercial Papers," "Contracts," "Notes," "Property, Real and Personal." The work is well bound in red cloth but the paper and typography do not approach the standard suggested by the importance of the subjects treated. There are also a few of the annoying errors which creep into publications, often in spite of the diligence of scrupulous proofreading. What should be the third line of page 115 is missing, and elsewhere there are evidences of misfortune. The book is published by Daniel Stern, 69 Dearborn St., Chicago, and is sold for $3.50.

The first meeting of the Engineers' Society of Western Pennsylvania since the June meeting was held at Pittsburg on Tuesday evening, Sept. 23. It was almost entirely given over to a discussion of securing better water shipping facilities for the city of Pittsburg. Capt. William L. Sibert, corps of engineers, U. S. A., in charge of the work on the harbors in the Pittsburg district, read a paper entitled "The Function of the Rivers in Maintaining Pittsburg's Industrial Supremacy." Capt. John F. Dravo read a paper on the "Artificial Limitations of Commerce on Our Rivers." A description of the new railroad bridge under erection by the Pennsylvania Railroad Co. over the Allegheny River was given by E. A. Amaden, of the American Bridge Co., and H. S. Wilgis furnished a paper on the elevation of tracks in Allegheny. A number of new members were enrolled.

A syndicate, organized by Charles W. Brega, of Chicago, has purchased the properties of the Londonderry Iron Co., Ltd., whose works are located at Acadia, Nova Scotia. There are two blast furnaces, 30,000 acres of ore land and the wood thereon. The two stacks have an annual capacity of 40,000 tons of foundry iron. Both have been idle since 1896, the property having been in liquidation since that time. A cast iron pipe foundry is also connected with the plant.

Operation in one department of the Grewis-Twaits hammered brass factory at Anderson, Ind., has commenced. The plant was recently moved from Cincinnati and will soon be in full operation.

TRADE PUBLICATIONS.

The Charles G. Smith Co., of Pittsburg, has brought out an attractive catalogue of machine tools. The firm handles the line of machinery carried by Hill, Clarke & Co., and also represents the Safety Emery Wheel Co., the Grant Tool Co., the Eastern Machinery Co. and the George Gorton Machinery Co. The catalogue is standard size and the compiler has endeavored to show only the illustrations setting forth the lines offered and has not submitted dimensions or detailed descriptions, as the company has special circulars of each tool, which will be forwarded on application.

A pocket catalogue of 464 pages, 7x4 inches, cloth bound, has been prepared by the Crane Co., of Chicago. The book covers the extensive line of standard, medium, low pressure, extra heavy and hydraulic goods in brass and iron, engineers supplies, tools, pipe, etc. The work is quite thoroughly indexed, a general index going into the subject matter in detail and there is also an index summary which classifies the goods under the subheadings as specified above.

"Efficient Triplex Power Pumps" is the title of the catalogue just issued by the Goulds Mfg. Co., of Seneca Falls, N. Y. This publication covers the company's entire product of triplex power pumps for every service, the book being compiled in sections, each devoted to the particular pump required for a specific purpose. The treatment of the subject is unusually complete and the catalogue is profusely illustrated with halftones of marked excellence. The pamphlet is 7x8 and contains 160 pages.

The Bremer Machine & Tool Co., of Kalamazoo, Mich., sends out a standard size catalogue of punches and shears, blacksmiths' punches, foot power hammers, milling machines and forging machines. The punches and shears are made both in single and double patterns and have some novel features. The milling machines are very rugged in appearance and seem well adapted for manufacturing purposes. The pamphlet contains a number of very flattering testimonials to the merit of the Bremer machines. The works of the Bremer Machine & Tool Co., as stated above, are located at Kalamazoo, but the main office is at 97-101 Woodbridge St., Detroit, Mich.

The Jeanesville pump is exploited in advance sheet No. 15 of the Jeanesville Iron Works Co., of Jeanesville, Pa., and Denver, Col. This is printed on 8x10¾-inch pages and bound in an ingenious cover, which folds together and is retained by a paper strip, the combination neatly avoiding the necessity of an envelope. A separate circular, advance sheet No. 16, is also received. Both publications deal with the details of the pumps and condensers manufactured by this company, No. 15 being devoted to pumps and No. 16 to condensers. The material is lucidly explained by a number of halftones and line engravings.

A catalogue and price list of heating stoves for the season of 1902-3 treats of the "Laurel" stoves and ranges manufactured by the Art Stove Co., of Detroit, Mich.

The W. P. Davis Machine Co., of Rochester, N. Y., has a well illustrated catalogue of lathes, drills, key-seaters, cutting off machines and special machinery. The company manufactures a complete line of lathes from 10 inches to 48 inches swing; all sizes of cutting off machines up to and including 6 inches capacity; key-seaters in two sizes, No. 1 and No. 2; upright drills from 12 inches to 32 inches swing. New sizes of machines are constantly being added to this list. A page of the catalogue is given to a map and a table of freight delivery time to the more important trade centers, computed from Rochester throughout a district bounded by Milwaukee, Richmond, New York and Portland.

Catalogue No. 10 describes the product of the Automatic Machine Co., of Greenfield, Mass., manufacturers of automatic screw machines, speed lathes and cutter grinders. These are illustrated with a number of attachments, such as single and double cutting off slides, belt polishing devices, chucks, clamp and lathe dogs, rests and special tools. The catalogue is standard size and extends to some 24 pages.

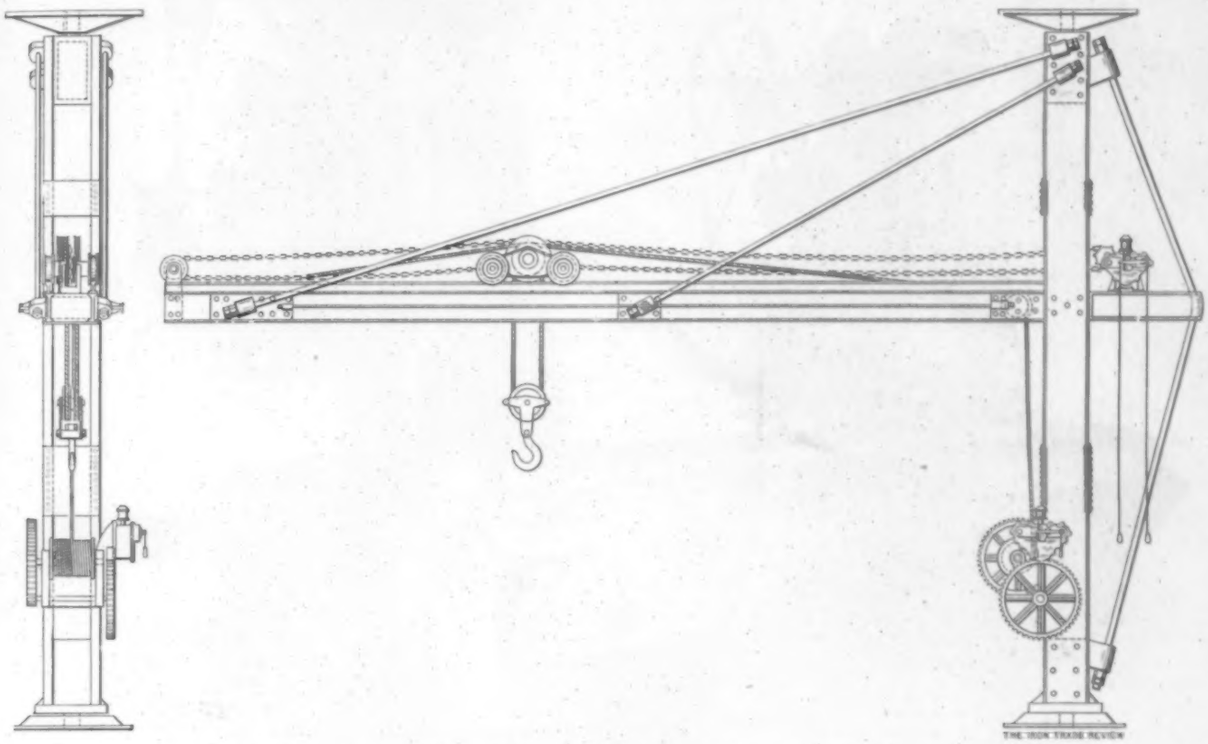


FIG. 2.—END AND SIDE ELEVATION OF THE PORT HURON AIR TOOL CO.'S CRANE.

The Derry-Collard Co., of 256 Broadway, New York, has issued a neatly printed card entitled "Vest Pocket Information for Machinists." The caption well describes the class of information, but the data will often be found as useful in the office as the shop. The card is sent on request.

The Robins belt conveyor is shown in a recent publication applied to the ordinarily destructive work of a salt plant. The application is illustrated by a number of halftones of different salt works. This make of conveyor is manufactured by the Robins Conveying Belt Co., of New York.

The National Oil Burner & Equipment Co., of St. Louis, Mo., has three new circulars in regard to its product. These comprise Price List No. 3 of boiler furnace equipments, fuel oil pumping systems, domestic and welding burners, steam traps, etc., the branch steam trap and directions for setting up and operating this make of oil burners for boiler furnaces.

THE MORTON MANUFACTURING CO.'S NEW SHAPER.

Many illustrations have appeared from time to time of traveling head shapers, but the machine illustrated in Fig. 1 is something entirely new and embodies a number of noteworthy features. The tool is built on the Morton method embodying the drawing cut, with steel ram, heads and main driving gear, and is constructed with a heavy bed which is stiffly braced and cross-ribbed. On this bed rests the vertical column which is suitably fitted and gibbed. The movement of the column on the bed is obtained by a screw. This screw remains stationary, however, the nut rotating. The apron of the shaper is gibbed and fitted to the vertical column, and the vertical adjusting screw is also stationary and operated by a rotating nut. These rotating nuts are fitted with ball-bearing thrust collars.

The ram is square and has a bearing on all four sides, wear being taken up with taper gibs. The stroke is adjusted by tappets on a circular disc and a suitable lever is provided whereby the movement may be reversed at any part of the stroke. The machine has automatic feeds in both directions and is also provided with means whereby it may be moved by power, either vertically or horizontally, for purpose of adjustment. The countershaft is provided with a friction clutch and is stopped and started instantly at any part of the stroke by means of a lever provided for this purpose.

The friction feed is of the automatic relieving type and it is positive in its movements. The reciprocating motion of the ram is obtained by two friction clutches, one being operated by an open belt and the other by a cross belt. The ram has a quick return stroke with a speed ratio of three to one. The machine is also provided with a coil spring counterbalance for the vertically moving apron. The special construction of this counterbalance is a number of heavy coil clock springs in a suitable casing, and the casing remains stationary, the shaft to which one end of these springs is attached revolving, and connected to the shaft of sheave wheels by suitable gearing. As the apron is raised and lowered, these springs are made to wind and unwind as the movement may require. The rail bearings on all portions of the machine are square and the gibs employed are of the taper type.

One novel feature of this shaper is the vertical feed on the column, which enables the machine to take vertical side cuts and makes it well adapted for internal work. The head may be removed and a special head secured to the end of the ram so that internal slotting may be accomplished with this tool. Both heads feed independently of each other and obtain their feeding power with rotating nuts from the same screw. Electricity is the power used, each head being driven independent of the other, so that either one may be brought into action and operated entirely by itself.

The machine has a 36-inch stroke, 30-inch vertical feed on the column, and the length of the bed is 14 feet. It is built either single or double-headed and furnished with one or two tables as the case may require. It may also be used in the capacity of a portable shaper, as with the vertical adjustments on the column it is adapted to be used in connection with a floor plate, in planing off spots on large castings, pillow blocks for medium sized Corliss engine frames, etc. The plate on the front side of the column is planed so that a suitable bearing may be placed in between the work and the frame of the machine, thereby placing the thrust of the cut solidly against the column.

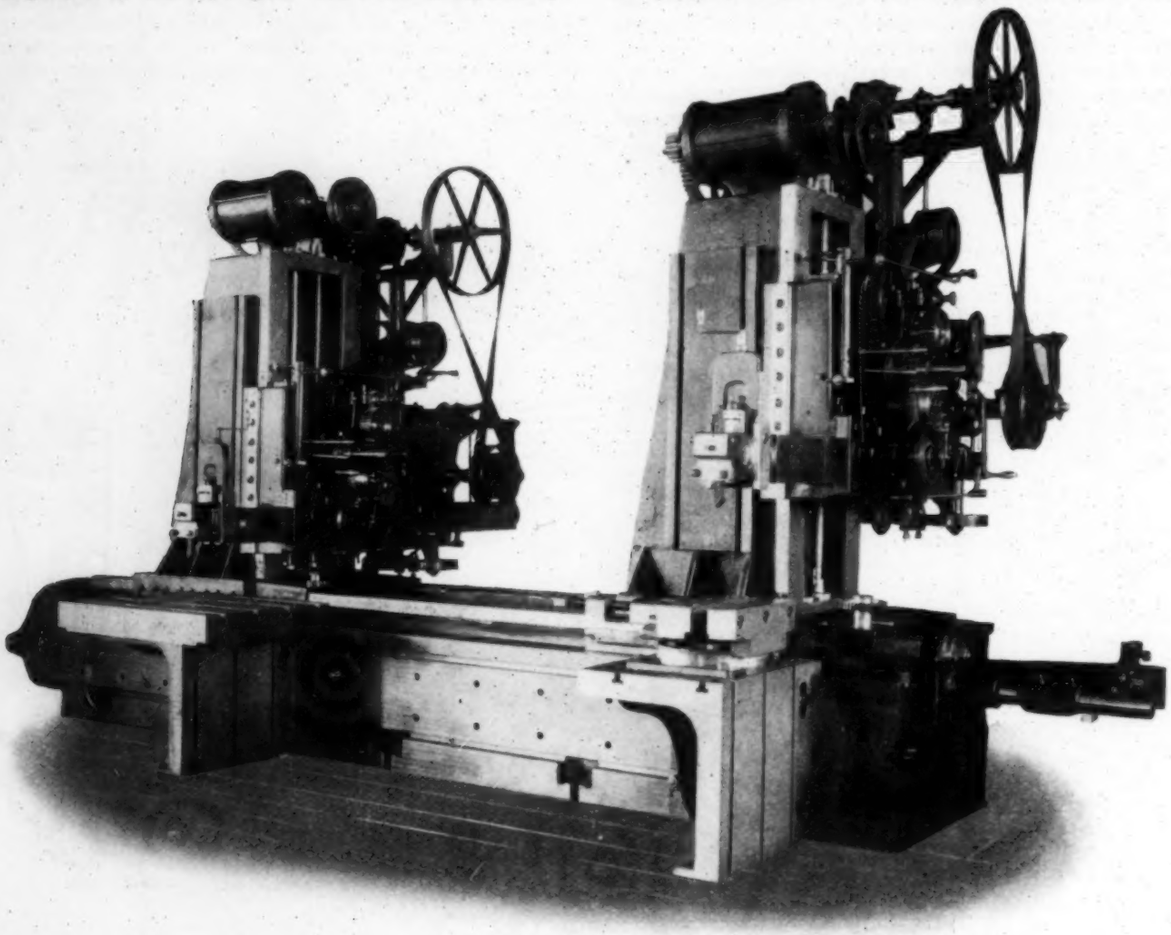


FIG. 1.—THE MORTON MANUFACTURING CO.'S NEW SHAPER.

The tool is heavily geared and capable of taking a cut 1¼ inches deep in steel, with 1-16-inch feed. When so desired, it can be constructed with tables made to raise and lower for purposes of adjustment. One particular advantage with this style of shaper is that one head can be operated on a piece of work 30 inches above the table, while the other head may be operated at any intermediate point. For the purpose of illustration, we refer to Fig. 2, where the machine is furnishing an opening in a solid end connecting rod. It will be noticed

that a suitable adjustable chuck is provided for holding the end of the rod to be machined and it will also be seen that a support is placed between the top of this chuck and the column of the shaper. This allows the machine to be fed vertically or horizontally, and when machining the opening, a cut may be taken across the bottom, then the head turned 45 degrees and a cut taken up the side. It can then be changed and a cut taken across the top and another change made and a cut taken down the end. This enables the opening of a connecting rod to be planed out on all four sides, the rod remaining in a stationary position. This drawing shows an adjustable jack for supporting the outer end of the rod, which is intended to be used with a single-headed machine.

The engraving Fig. 3 illustrates the end view of the machine and also shows the chuck holding a large strap. The chuck being adjustable, straps of any size may be readily machined. With the automatic feeds on the column, and the range which this shaper has, a great deal of irregular work may be accomplished which has heretofore been difficult to reach with any tool. Fig. 4 illustrates the machine as used in connection with a floor plate, planing out a pillow block in a heavy engine bed.

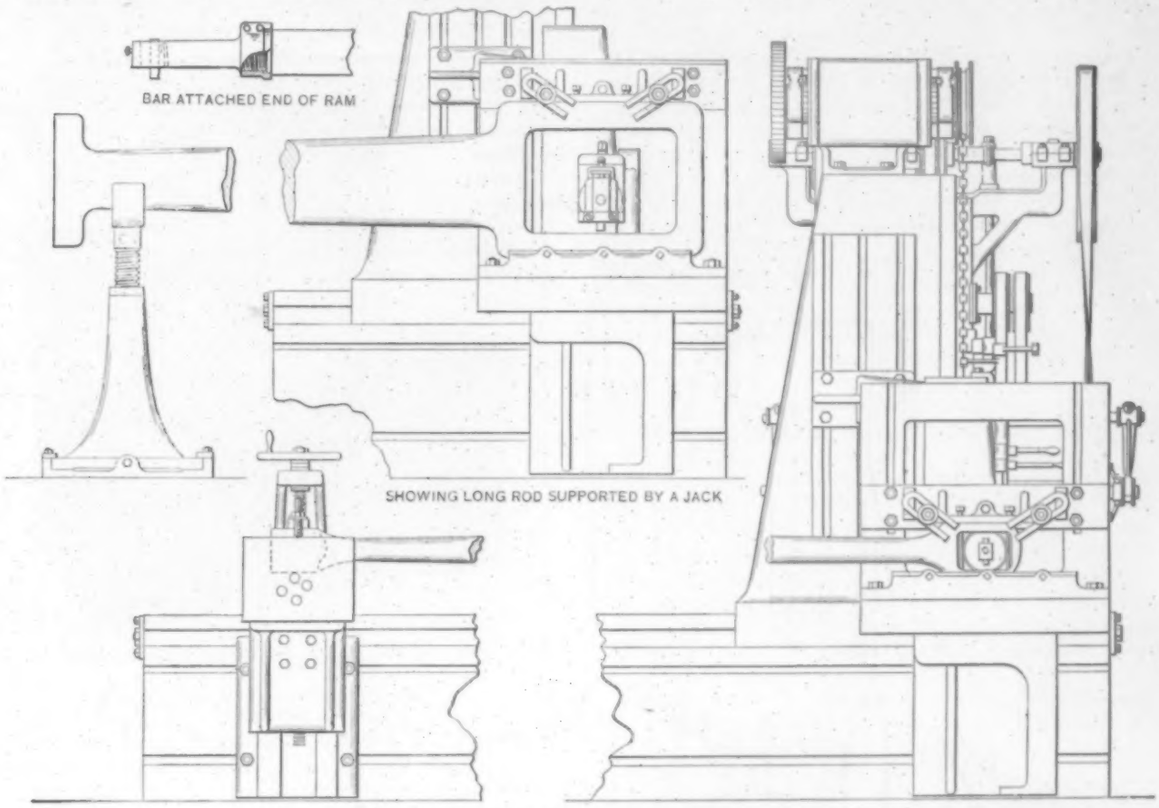


FIG. 2.—MORTON SHAPER AT WORK ON A SOLID END CONNECTING ROD.

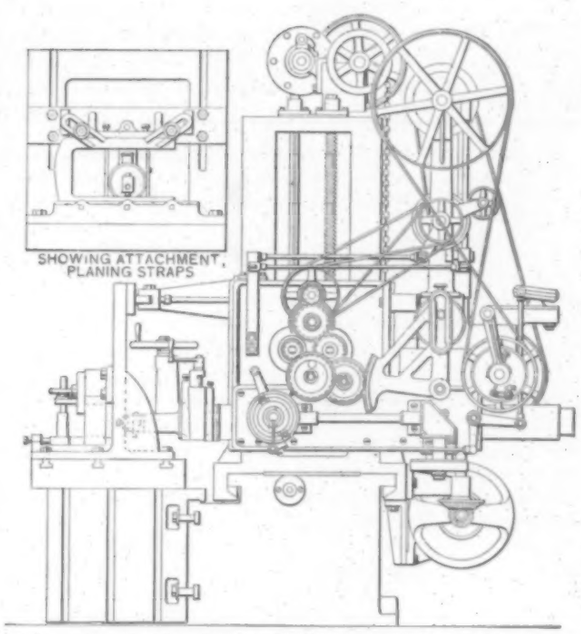


FIG. 3.—END VIEW OF MACHINE, ALSO VIEW OF ADJUSTABLE CHUCK HOLDING LARGE STRAP.

The manufacturers are the Morton Manufacturing Co., of Muskegon Heights, Mich.

Production of Pig Iron in Canada in the First Half of 1902.

The American Iron and Steel Association has received direct from the manufacturers the statistics of the production of pig iron in Canada in the first six months of 1902. The figures show a slight increase as compared with the last half of 1901, but a very great increase as compared with the first half of that year.

In the first six months of 1902 the production of all kinds of pig iron in the whole of the Dominion amounted to 157,804 gross tons, as compared with 149,952 tons in the last half of 1901 and 95,024 tons in the first half of the year. The increase in the first half of 1902 over the last half of 1901 was 7,852 tons, or over 5 percent, while the increase over the first half of 1901 was 62,780 tons, or over 66 percent. Of the total production in the first half of 1902, 12,000 tons were Bessemer and low phosphorus and 57,209 tons were basic pig iron. The coke furnaces made 147,892 tons and the charcoal furnaces 9,912 tons. Neither spiegeleisen nor ferromanganese has been made in Canada for several years.

The unsold iron held by Canadian pig iron manufacturers on June 30, 1902, none of which was intended for their own consumption, amounted to 37,721 gross tons, as compared with 59,472 tons on December 31, 1901, and 28,711 tons on June 30, 1901. Of the unsold iron on hand on June 30, 1902, less than 2,000 tons were made with charcoal, the remainder being coke iron.

On June 30, 1902, Canada had 14 completed blast furnaces, of which eight were in blast and six were idle. Of this total nine were equipped to use coke for fuel, four to use charcoal, and one to use mixed charcoal and coke. In addition three coke and two charcoal furnaces were being built on June 30, 1902, but work upon two of the coke furnaces was temporarily suspended.

PLANS OF THE PASSAIC STEEL CO.

The Passaic Steel Co., of Paterson, N. J., which is being formed to purchase the plant, accounts and good will of the Passaic Rolling Mill Co., of the same city, will have a capital stock of $5,000,000 and an authorized bond issue of $2,500,000, of which amount $500,000 will be reserved for contemplated improvements upon the property. It is proposed to make carefully considered additions to the plant and remodel certain parts, so that the output will be increased to 100,000 tons and the character of the product improved. The plant of the Passaic Rolling Mill Co. is located at Paterson, the property consisting of 25½ acres of land, situated in the heart of the city, of which about 10 acres are now used by the company in its business. The remainder of the property is well adapted for extending the plant. The present output is 40,000 tons per annum, of which about three-fourths is plain material and the remaining one-fourth is work that has been fabricated in the company's bridge shop.

It is estimated that after the improvements have been made the cost of production per ton will be largely decreased. It is believed the saving effected will amount to at least $5 a ton upon the entire product. It is also proposed to enlarge the bridge shop of the company, which will make it a larger customer for the structural steel shapes rolled in the company's mills. The Passaic Rolling Mill Co.'s plant has been in successful operation for over 33 years. It is the only mill of its kind east of the Delaware River, and its location near the New York and New England markets gives it a decided advantage.

SUCCESS OF AMERICAN MATCH-MAKING MACHINERY.

American machinery has scored a remarkable success in matchmaking in Germany and the German manufacturers, who have $8,750,000 invested, are greatly distressed by the competition of the American Diamond Match Co.'s new factories near Mannheim. Matches that 6 months ago were sold from the German works at $20 a case are now selling at $16 a case, or $1 below the cost of production by the old-fashioned process. The Diamond company uses machinery from the United States. The German branch has been in operation for 3 months. Forty match manufacturers, representing the entire match industry of Germany, including the Diamond factories, met a few days ago in Berlin to consider the situation.

Manufacturer after manufacturer asserted that he was disposing of his goods below cost and each speaker attributed the necessity of so doing to over-production and the competition of the Diamond Match Co. The representatives of the latter company said that other match manufacturers could not continue to do business unless they found a way to obtain machinery as good as that used by the Diamond company. The possibility of limiting the production of matches was discussed, but the representatives of the Diamond company said the only limit to their production would be inability to sell the product of all their machines now installed and that of all the machines that could be installed. The meeting dissolved without having reached an agreement as to how the competition of the Diamond company could be met.

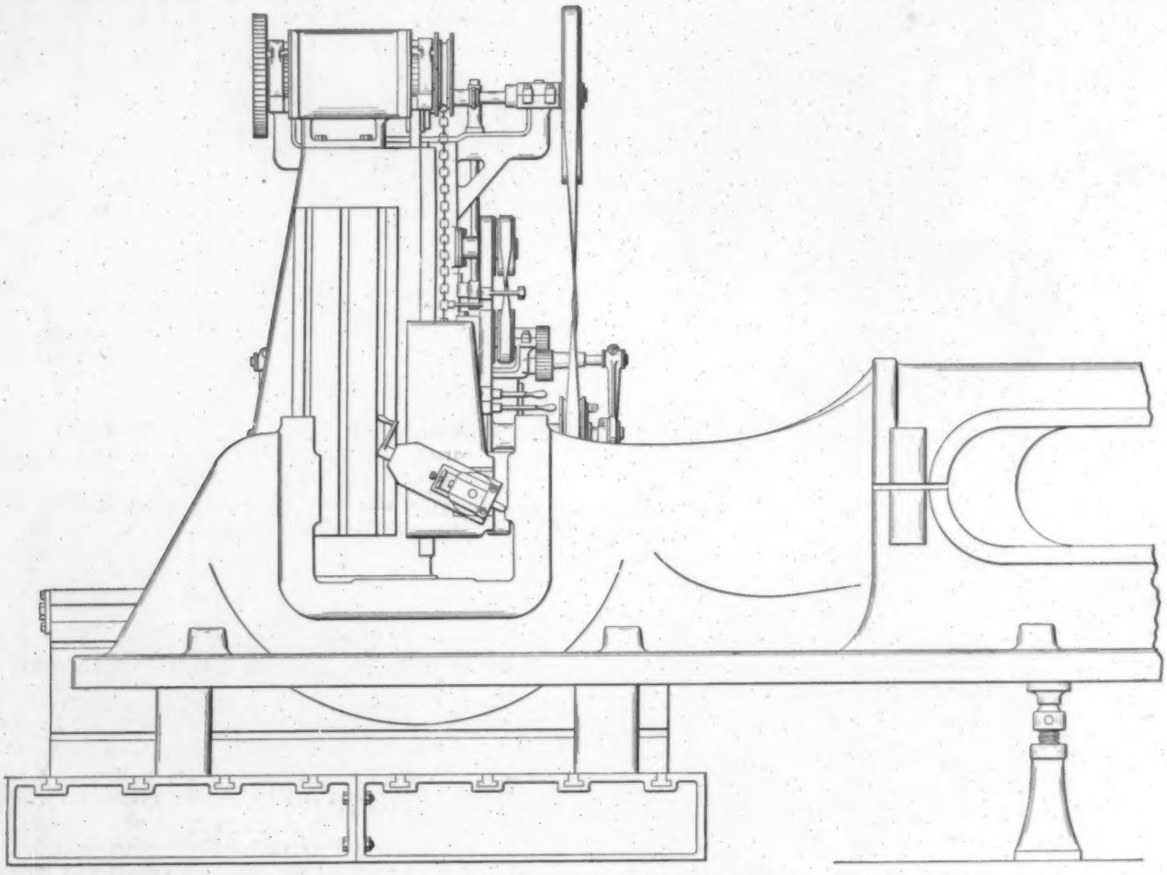


FIG. 4.—MORTON MACHINE IN CONNECTION WITH FLOOR PLATE, PLANING OUT A PILLOW BLOCK IN A HEAVY ENGINE BED.

The first steel rail was turned out a few days ago at the plant at Cumberland, Md., purchased from the Crucible Steel Co. by H. H. Dickey. The plant had been dismantled and later overhauled and new machinery installed by the Maryland Rail Co., organized by Mr. Dickey.

The International Association of Machinists will meet in Cleveland the latter part of October. The nine-hour day will be the principal subject considered.

The name of the Jackson Drop Forging Co., Cleveland, has been changed to the Cleveland Drop Forging Co. and the capital has been increased to $25,000. Plans for increasing the capacity of the plant are under consideration.

Owing to the blowing out of Furnace A of the Colorado Fuel & Iron Co. and the short supply of pig iron meantime, the converter and rail mills at Pueblo were shut down last week. Repairs are being made meantime.

THE VULCAN ANNEALING BOX AND COMPOUND.

The "Vulcan" steel annealing box for shop use is illustrated in Fig. 1 and is made of sheet steel, 18 gauge, with dimensions of 18x10x10 inches. The cover has been removed and rests on the upper and rear edge of the box while the latter is piled high with "Vulcan" annealing putty. Both are manufactured by the Ray Automatic Machine Co., of Cleveland. The "Vulcan" annealing putty has been the product of a long experience in shop routine hardening and is one of those useful inventions

FIG. 1.—THE VULCAN ANNEALING BOX.

that the alert manager of tool steel consuming plants will best appreciate. The putty has been used in connection with the most stubborn steels and these have been brought to an easily workable condition without in any way impairing the life of the material. Mushet or self hardening steels are readily annealed so that they can be easily filed, turned or otherwise machined. The annealing material has been given a four years' practical test in shops with excellent results. As it is almost impossible to make a good job with the handicap of poorly annealed steel and there is in connection with this the loss and breakage of valuable milling cutters as well as the increased wear and tear on lathe and planer tools, files, etc., there is here a chance of improving what is usually the blind end of the business, the steel and blacksmith combination which is not invariably a happy one.

Some examples of the work are illustrated in Fig. 2. The 14-inch files tell their own story. The two heavy pieces of steel, the one twisted in auger style and the other a sort of reversed S, are bent this way out of lengths of ¾x1¾ inches Sanderson steel. The piece of metal in the middle of the cut is twisted from ⅜ Mushet steel.

A perusal of the directions for using the annealing material does not disclose any unusual difficulties, as compared with the method followed with lime and other well known shop expedients. The putty is removed from the box until it is about half full. The steel is then heated to a good cherry red and placed as near the center of the box as possible, the putty is then thrown in until the box is full, afterwards packing the material tightly together and covering with the lid. The steel is allowed to remain in the box until cold. The plan adopted in the annealing of Mushet steel is to pack a number of bars together, so that they will make in all a bundle about 2 or 3 inches square. This is then heated and packed in the box, as in the other case.

The furnace of the Marting Iron & Steel Co. and the Union Iron & Steel Co., Ironton, O., have been blown out on account of the inability of the operators to secure coke. The furnaces are dependent upon the West Virginia fields, most of which are inoperative at present on account of strikes.

PERSONAL.

H. C. Frick, who has been spending some months at his summer residence, Prides Crossing, Mass., returned to Pittsburg last week.

Thomas R. Pickard, for 40 years superintendent of the foundry of the Bass Foundry and Machine Co., Fort Wayne, Ind., will resign shortly. He will be succeeded by Richard Walsh, who is already preparing to assume active charge.

Charles H. Gage, of Denver, Col., was in Pittsburg last week, endeavoring to interest steel manufacturers in that district to invest in a large steel plant at Farmington, New Mexico. The company of which he is president is known as the Southwestern Fuel & Iron Co.

P. T. Berg, chief engineer of the Homestead Steel Works of the Carnegie Steel Co., Pittsburg, has resigned and has been succeeded by R. H. Stevens. For several years Mr. Berg has been suffering from bronchial troubles and has decided to return to Sweden to regain his health. He is a graduate of the Imperial University, Stockholm, Sweden, and came to this country 20 years ago, entering the employ of the Edgar Thomson Steel Works. On Saturday evening, Sept. 27, he was given a complimentary dinner at the Hotel Schenley by the superintendents of the various departments of the Homestead plant.

A. C. Dann, vice president of the Ohio Cultivator Co., has resigned to become connected with a Milwaukee company in similar lines.

Charlemagne Tower, ambassador to Russia, who has been appointed ambassador to Germany, to succeed Andrew D. White, was president of the Duluth & Iron Range Railroad in 1892, and the family name is born by the principal town on the Vermillion range.

W. G. A. Miller, formerly manager of the ornamental department of the American Bridge Co., has been appointed purchasing agent of the company, with offices at 259 South Fourth St., Philadelphia.

John Fritz, who erected the Trinity Memorial Episcopal Church at South Bethlehem, Pa., at a cost of $50,000, has also donated a parsonage to the congregation. It will be of blue granite, and will cost $10,000.

The directors of the Tidewater Steel Co. now are: F. W. Wood, president of the Maryland Steel Co.; Charles T. Schoen, ex-president of the Pressed Steel Car Co.; Evans R. Dick and George McCall, of Dick Brothers & Co.; George S. Graham and A. S. L. Shields, lawyers; ex-Senator Charles A.

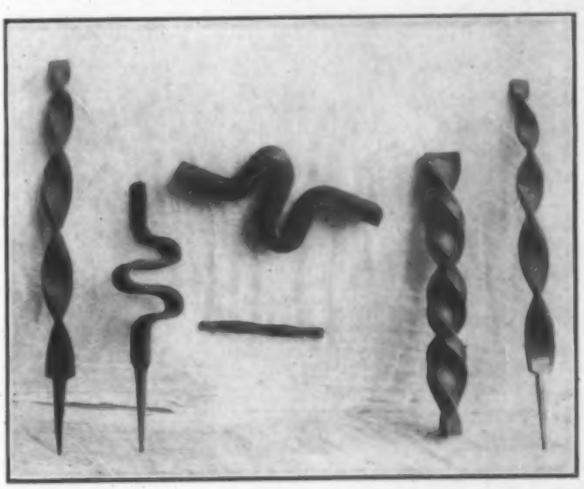


FIG. 2—SAMPLES OF ANNEALED STEEL.

Porter, Russell W. Davenport, formerly of the Bethlehem Steel Co., and President C. E. Stafford.

Plans have been filed at the Bureau of Buildings, New York, for the six-story residence of President C. M. Schwab. It will be 90x107 feet and will stand on the block bounded by Riverside Drive, 73rd and 74th streets and West End Ave. The building will be constructed of granite and is estimated to cost $900,000.

Henry Phipps has arrived at New York from a European tour. He is named in cable dispatches as the giver of $100,000 for the relief of destitute Boers.

The Machinery and Metal Working Trades—News Letters from Selling Centers.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, No. 150 NASSAU ST., Sept. 30,

The machinery market in this vicinity for September was a continuation of the activity and buoyant feeling, which have been observable for several months. By way of contrast with August, the general impression is that it was far more productive of trade, although expectations never run high for August. The larger houses in the trade expressed themselves as particularly pleased with the business they have done this month. In many cases the transactions represented deals that had been hanging fire during the summer months, though new business in good volume made its appearance also. Among the smaller houses business came in steadily, especially in small orders, so that the totals for the month were well up.

No feature of the month was more noticeable than the numerous inquiries it developed. Every house visited seemed to have something on the tapis indicating orders in the near future. On all hands the statement that "there is plenty of business in sight" was made with confidence. It can be stated without any qualification that there never was a time when there was so much business in prospect as now. Only a few days ago nearly every machinery house in this vicinity submitted bids for machine tools for installation in the shops of the General Electric Co. at Schenectady, N. Y. The total runs well up into six figures, some going as far as to put it at $200,000. The last of the bids from the larger houses went in on Saturday, and it will be several weeks before the awards are made. Then the railroads are to be heard from with some good orders later on. Scarcely a week passes without the trade hearing of some line about to enlarge its repair shops. Prominent in this category are the repair shops of the Pennsylvania Railroad, at Altoona, Pa., where it is said the improvements will mean an outlay of $500,000. It is also known that the Delaware, Lackawanna & Western Railroad will shortly erect new repair shops at East Buffalo, N. Y., and Scranton, Pa., and the Illinois Central Railroad will do the same at Memphis, Tenn. Another large order which will reach the trade in the near future, will be for the equipment of the new shops of Henry R. Worthington, pumping machinery at Harrison, N. J. From an official of the concern it is learned that the order for the equipment will be given not later than the latter part of December. The trade is awaiting definite information with a great deal of interest, as the equipment will mean an outlay of $500,000. Specifications for the equipment would be out in a few weeks but for the delay in the construction, on account of the difficulty of getting material. Inability to get cement alone has prolonged the work of construction nearly two months beyond calculations. In power transmitting machinery, business is reported to be especially brisk. Manufacturers say that they have enough orders on their books to keep them going for at least six months. A. & F. Brown, of this city, large manufacturers of power transmission machinery, have received so many orders of late that they have decided to increase the capacity of their plant at Elizabethport, N. J., by at least 50 percent. Other manufacturers are forced to operate day and night to keep up with their orders. Both manufacturers and sales agents of traveling cranes speak of unprecedented activity in their line. Some works are so crowded with business that delivery cannot be promised within a year. One manufacturer said to the writer: "They have been talking of a crane combination for some time, but everybody is doing such good business nowadays, that it will take some extremely liberal inducement to get some of them to join it."

The recent advances in lathes, planers, shapers, and drills are being strictly adhered to, disappointing expectations held in some quarters when they were made. Now and then one hears of deviations being made from the increased schedule, especially by one or two manufacturers of shapers and drills, but in the main, prices are being maintained. An official of a large machine tool industry expresses the opinion that a further increase in prices would be justified, because of the increasing disposition of skilled labor to demand higher wages and shorter hours, as well as the increased cost of iron and of operation in consequence of the soaring price of fuel. Belated deliveries still continue to plague the trade. It frequently happens that when a bidder loses an order, he attributes it to his lucky competitor having submitted a better price, but it is not unusual to hear of an order being given with quicker delivery as the controlling factor. There were no new developments of note during the month in the market for American machinery abroad. This class of trade may be said to be at a standstill. American manufacturers find that they can sell machinery in larger quantities and on better terms here than abroad, and will not give any attention to foreign business while these conditions prevail. Not long ago manufacturers of motor driven tools made large shipments to the Continent, but now they are not taking any orders from abroad. German makers are disposing of their surplus stock at any figure, thus making American competition an impossibility. The situation in electrical equipment in Germany can be readily understood when it is stated that American manufacturers are constantly in receipt of applications for employment from German electrical engineers. One concern alone received six letters of this kind during the past week. In discussing the outlook for trade, it is noteworthy that everybody speaks of it in a hopeful way. Even those who call attention to the fact that there must be an end to the present industrial prosperity are unable to specify anything that indicates when that time will be.

The Buckeye Engine Co., of Salem, O., with offices at No. 39 Cortlandt St., has received an order for a high-speed engine of several hundred horsepower from the C. Pardee Works, at Perth Amboy, N. J.

The Lawrence Machine Co., of Lawrence, Mass., whose New York offices are at No. 39 Cortlandt St., has received a large number of orders recently for centrifugal pumps for installation in various paper mills throughout the Eastern States.

Woolston & Brew, New York representatives of the Brown Corliss Engine Co., and the Ball Engine Co., at No. 39 Cortlandt St., say that orders for small engines of both makes have been a feature of their business during September.

The Niles-Bement-Pond Co., of No. 136 Liberty St., reports that its September business showed a most gratifying increase over August. The company was favored with some good orders from the Pennsylvania Railroad. Its crane department is particularly active. A recent order received was for a 25-ton traveling crane from the Rhode Island Suburban Railroad for installation in its new plant at Providence, R. I.

At the New York offices of the Riter-Conley Mfg. Co., of Pittsburg, the information was given that the company has so much construction work on its books that in a large number of cases delivery cannot be promised before 1904.

The Ruggles-Coles Engineering Co., of No. 39 Cortlandt St., has done a good business recently in supplying dryers for cement establishments. Among the larger orders received were those from the Lehigh Portland Cement Co., at Mitchell, Ind., and the International Cement Co., Pittsburg.

Olney & Warren, of No. 36 Dey St., did an exceptionally good export business during September. One order was for a large air compressor for Spain, which with necessary equipment, will weigh several tons. They also received orders for vertical and horizontal steam engines for use in Cuba and on the Continent of Europe. Their machinery and factory supply business has been very brisk.

The Thayer Co., Ltd., of No. 39 Cortlandt St., has received an order for a 2,000 horsepower steam boiler from the Hartford Carpet Works, Hartford, Conn. The company is bidding on considerable steam boilers for manufacturing and electrical plants.

Sheriff, Swingley & Co., Ltd., of No. 122 Liberty St., manufacturers of mining machinery, have shipped considerable material recently to South Africa.

George Place, Eastern representative of the J. A. Fay &

Egan Co., of Cincinnati, at No. 120 Broadway, recently placed some good orders for woodworking machinery for installation in the new shops of the New York, New Haven & Hartford Railroad, at Readville, Mass.

At the New York office of Schuchardt & Schutte, No. 120 Liberty St., it is reported that milling machines are in more request abroad than any other kind of machine tools, and that there is hardly any demand for lathes at all. Max Dannert, the manager of this concern, is now on his way to Europe, where he will remain several months.

The Wheeler Condenser & Engineering Co., of No. 120 Liberty St., made some good shipments of sugar machinery to Cuba during the past month. The company reports its foreign trade as satisfactory, while its domestic business has been marked by fair orders for surface condensers and air pumps.

The Standard Equipment Co., of No. 120 Liberty St., manufacturers of "Monarch" pneumatic tools, says all of its products have been in better demand of late than for months past

The George V. Cresson Co., No. 141 Liberty St., manufacturer of power transmitting machinery, has made good shipments recently to Mexico and New England. The small orders received are pretty well distributed throughout the country.

The B. F. Sturtevant Co., of No. 131 Liberty St., manufacturer of blowers and heating and ventilating appliances of all kinds, announces that its new plant at Readville, Mass., is fast approaching completion. It will provide employment for about 5,000 men.

The Fairbanks-Morse & Co., of Chicago, which recently established a New York branch office at No. 133 Liberty St., reports that its business in gas and oil engines during September was especially good.

The Crocker-Wheeler Co., of No. 39 Cortlandt St., reports the following orders for motor driven tools: One 150-kilowatt generator, from the International Silver Co., Meriden, Conn.; one 200-kilowatt generator, from the J. B. & J. M. Cornell Iron Works, Cold Spring, N. Y.; and one 200-kilwatt generator, from the Remington Typewriter Works, Ilion, N. Y. The company has also received orders for complete electrical equipment from the Naugatuck Iron Works, Union City, Conn., and the Pratt & Cady steam valve factory, Hartford, Conn.

CHICAGO AND THE WEST.

OFFICE OF *The Iron Trade Review*,
934 MONADNOCK BLOCK, Sept. 30.

Manufacturers of machinery and shop equipment of all kinds in this section report an excess of business and a condition of industrial affairs without parallel in their recollection. Progress and expansion are the order of the day, and in no part of the country has there been a greater growth in this respect than in the West. New shops are springing into existence everywhere and extensive improvements are being made to existing plants; yet, notwithstanding the large increase in the productive capacity, it is not nearly great enough to meet the constantly growing demand. The statement is literally true that anything with iron or steel in it sells on sight, and this particularly applies to concerns manufacturing machinery for the metal trades. All report that they are from two to six months behind in shipping their orders, with no prospect of catching up for months to come. More stress is laid on this statement, perhaps, in view of the condition of the raw material market. With the West almost denuded of stocks of pig iron and coke, and with no assurance from manufacturers as to the extent of future supplies, the impression appears to be gaining ground that there may be soon an indefinite suspension of the industrial activity of the country unless the railroads in the East better their hauling facilities.

The prevailing prosperity includes manufacturers of every type of machinery, from the smallest horsepower gasoline engine to the largest steam engines, and from the smallest shop tools to the biggest lathes and planers. A good indication of this fact is in the dullness in the second hand tool line, dealers in Chicago reporting a scarcity of desirable equipment of this kind. Deliveries on new shop tools and electrical equipment cannot be obtained within six to nine months from date of placing order, and on engines and boilers from six to twelve months is asked by all manufacturers. A more concrete illustration of the large amount of business on the books of manufacturers may be taken from the report of a firm making machine tools in Wisconsin. This company was organized about six months ago to manufacture turret lathes, and it already has orders on its books sufficient to keep its shops busy for the next six months if not another order is taken in that time. Another company in an Illinois city, manufacturing air compressors, completed last spring a large warehouse for the purpose of keeping in stock a line of its products for prompt shipment. It has never been able to use this building for the purpose for which it was originally intended; and it is now being used as an addition to the machine shop. Many instances of this kind point to a good reason why manufacturers hesitate in selling their old equipment—especially, when in addition to the long wait for deliveries is taken into consideration the higher cost of new tools.

Probably the most pronounced activity in a year of unusual conditions, is in the agricultural and structural lines. From the farming districts of the West and the irrigated sections of the Southwest, has come an extraordinary demand for gasoline engines and pumping machinery. Fairbanks, Morse & Co., Chicago; the Weber Gas & Gasoline Engine Co., Kansas City, Mo.; Charter Gas Engine Co., Sterling, Ill.; Stover Mfg. Co., Freeport, Ill., and other manufacturers of this class of machinery, report an abundance of orders. Three of the companies mentioned have recently completed extensive additions to their plants, and the remaining concern has plans under way for new buildings. The excellent crop returns of last year and this year have also stimulated the demand for all kinds of plowing and threshing machinery, which in their turn have resulted in increased orders for machinery and supplies necessary to manufacture same. The activity in the building industry has brought increased demands for erecting machinery, hydraulic, steam and air tools, it being further accentuated by the extensive improvements undertaken by railroads in their maintenance of way departments. Village boards in country districts are also feeling the quickened pulse of prosperity, placing orders freely for improvements to their streets, highways and public buildings. One manufacturer of electric lighting plants, stated that there had been a great increase this year in the number of orders for this class of machinery from country towns. Builders of heavy engines, blowing and rolling mill machinery, are "snowed under" with orders for equipment for iron and steel plants. As one representative said, if deliveries could be promised within a reasonable time, he could within a week take orders for at least a million dollars' worth of machinery. The remarkable growth of mining operations in the discovery and development of new properties, has also benefited manufacturers of mining machinery in this city. The Allis-Chalmers Co., Link-Belt Machinery Co., Sullivan Machinery Co., American Engineering Works, Goodman Mfg. Co., all report that their shops are crowded with work, and that it is not so much a question of getting orders as it is to make the deliveries in the required time.

Increased demand for American tools and engines is also coming from foreign countries. Henry E. Pridmore, of Chicago, reports orders for molding machines from England and the Continent; Geo. Whiting Co., Chicago, has orders from South America and Germany for punching and shearing machinery; Fairbanks, Morse & Co., through its London office, increasing demand for gasoline engines; the Vilter Mfg. Co., Milwaukee, is in receipt of orders regularly from France and Germany for refrigerating machinery, and it recently shipped a large consignment to the Philippine Islands. The Marine Iron Works, Chicago, have many orders on their books for river launches and marine engines for South American States; large orders for mining machinery have been received by the Allis-Chalmers Co. for shipment to Mexico, South Africa and Australia, and steam engines and electrical equipment for lighting and power plants from this company's shops are going abroad in increasing numbers. The rapid expansion of foreign trade proves conclusively the superiority of American made machinery, and is indicative of the early domination of the world's markets by this country. The following are a few of the reports which we have received:

Novelty Iron Works, Dubuque, Ia., informs us of a very gratifying demand for the improved "Boss power hammer" and the "Evarts-Triumph shingle machine." It has been un-

able to catch up with orders for six months past, and will add new tools and new buildings to its plant in the near future.

C. F. Elmes Engineering Works, Chicago, have experienced during the summer months a good demand for linseed-oil machinery from manufacturers of this product. They have orders on their books for hydraulic presses, pumps and accumulators for the Northern Linseed Oil Co., Minneapolis; for accumulators, cake formers and hydraulic presses for the Crescent Oil Co., Chicago, and have shipped recently a consignment of crushing rolls to the Midland Linseed Oil Co., Minneapolis, Minn., and hydraulic pumps and accumulators to Mann Bros. Co., Buffalo. The hyraulic wheel press for use in machine shops, which the company placed on the market a short time ago, is also meeting with good demand. Packard Machinery Co., Chicago, has placed an order for a 150-ton press; Western Electric Co., Chicago, for a 100-ton press; Ball Engine Co., Erie, Pa., for a 250-ton press, and the Southwark Foundry & Machine Co., Philadelphia, for a 450-ton portable press.

Barnard & Leas Mfg. Co., Moline, Ill., states that demand for flour mill and elevator machinery is very good and that its magnetic separators are finding their way into more foundries this year than for some time past. The company is contemplating some important improvements to its plant to be made in the near future.

Joseph T. Ryerson & Son, Chicago, state that the domestic demand for the line of machinery which they handle exceeds their ability to supply, and that they are getting an increasing number of inquiries for heavy machinery for export. They believe from their own experience that the capacity of the tool producers of the country will be taxed to the utmost during the coming season.

Bignall & Keeler Mfg. Co., Edwardsville, Ill., advise us that while no unusual orders have been received, it is in receipt of a steady flow of inquiries and orders for one, two and three machines from all parts of the country. The business at the close of this year will be the largest in the history of the company.

Delivouk & George, Chicago, report that the demand for punching presses and grinding machinery has been very good, and the company looks for a busy winter.

Green Engineering Co., Chicago, manufacturer of the Green traveling link grates, reports among its recent sales, contracts for the installation of its appliance in the boiler plants of the following companies, some of which have been completed: American Tin Plate Co., Elwood, Ind., and Monessen, Pa.; Union Steel Co., Donora, Pa.; LaBelle Iron Works, Steubenville, Ohio; Pope Tin Plate Co., Steubenville, Ohio; W. S. Tyler Co., Cleveland, Ohio; Lake Superior Power Co., Sault Ste. Marie, Canada; Carnegie Steel Co., Pittsburg; American Sheet Steel Co., Struthers, Ohio; Chicago Union Traction Co., Chicago; Metropolitan Street Railway Co., Kansas City, Mo.; St. Louis Transit Co., St. Louis, Mo., Cleveland City Railway Co., Cleveland, Ohio.

Scully Steel & Iron Co., Chicago, is in receipt of orders during the past month from the following concerns: Drake, Williams Mount Co., Omaha, Neb.; Collingwood Shipbuilding Co., Collingwood, Ont.; Joliet Bridge & Iron Co., Joliet, Ill.; M. A. Ryan, Duluth, Minn.; Terre Haute Boiler Works, Terre Haute, Ind.; Rarig Engineering Co., Columbus, Ohio; Sutherland & Kelly, Troy, N. Y.; Skobis Bros., Milwaukee, Wis.; Diamond Boiler Works, Minneapolis, Minn.; P. J. Connelly, Knoxville, Tenn.; Kennicott Water Softener Co., Chicago, Ill.; Practical Gas Construction Co., North Chicago, Ill.; Mexican Petroleum Co., Tampico, Mex.; U. S. Navy Yard, League Island, Pa.

Hawley Down Draft Furnace Co., Chicago, reports a gratifying demand for the Schwarz furnace, among the recent sales being the following: Chicago, Rock Island & Pacific Ry., Chicago, one; J. B. Clow & Sons, Chicago, one; Penberthy Injector Co., Detroit, Mich., two; Detroit Lubricator Co., Detroit, Mich., five; Michigan Lubricator Co., Detroit, Mich., two; Michigan Brass & Iron Works, Detroit, one; Buckeye Iron & Brass Works, Dayton, O., one; Kelley & Jones Co., Pittsburg, one; United States Bronze Co., Cleveland, three; H. Mueller Mfg. Co., Decatur, Ill., two; Chicago City Railway Co., Chicago, one; Smeeth's Copper, Brass & Bronze Co., Chicago, one; Hewitt Mfg. Co., Chicago, one; Sterion Copper, Brass & Bronze Co., Chicago, one; Otis Elevator Co., Chicago, one; Otis Elevator Co., Yonkers, N. Y., one; International Steam Pump Co., Elizabethport, N. J., one, and one each for its plants at Cambridge, Mass., and Cincinnati, O.; William Powell Co., Cincinnati, O., one; Niles Tool Works, Hamilton, O., one; P. H. & F. M. Roots Co., Connersville, Ind., one; National Transit Co., Oil City, Pa., one; Thomas Brass & Iron Co., Waukegan, Ill., one; Nathan Mfg. Co., New York City, one; Haines, Jones & Cadbury, Philadelphia, one; American Locomotive Co., Richmond, Va., two; Standard Sanitary Mfg. Co., Louisville, Ky., two; Howe Mfg. Co., Louisville, Ky., one; Magnus Metal Co., Jersey City, one; Atlantic Brass Works, Jersey City, one; U. S. Navy Yards, Portsmouth, N. H., one; E. & T. Fairbanks Co., St. Johnsbury, Vt., three; Seaboard Air Line Ry., Portsmouth, Va., one; Chicago Telephone Supply Co., Elkhart, Ind., one.

H. W. Caldwell & Son Co., Chicago, manufacturer of power transmitting machinery, gears, etc., reports the general condition of all its lines as very good. The orders are not so difficult to get as it is to ship them out on time.

McDowell, Stocker & Co., Chicago, state that the business for the past month has been very satisfactory, and that the outlook is good. The company has taken a few good sized orders, but the most of its trade has been from concerns ordering from one to four machines to help out during the busy season. The greatest activity at the present time is reported to be among the manufacturers of agricultural implements, who are heavy buyers of new machines.

Garden City Fan Co., Chicago, manufacturer of fans and blowers, reports that it is crowded with orders and is from six to seven weeks behind in deliveries. The company recently moved into its new plant at Niles, Mich., where it has a largely increased capacity.

Stephens-Adamson Mfg. Co., Aurora, Ill., manufacturer of power transmitting machinery, advises us that its shop is full of work and that the prospects are it will be crowded for several months to come. The company is erecting a new office building, two stories high, 42x30, which will give increased room in the machine shop.

George Whiting Co., Chicago, manufacturer of punching, shearing and bending machinery, has been compelled by the heavy demand for its tools, to double the capacity of its pattern department, both in machinery and men employed, and also its draughting room force. New equipment has been added to the machine shop, largely increasing its capacity. The company is bringing out a special belt riveter of its own design, also a special high speed punch with patented clutch arrangements. It has recently received inquiries for prices on its machines from Germany and South America, and reports that it is highly gratified at the success which it has attained in the short period in which the company has been in existence. The following are some of the orders recently received: Atlas Engine Works, Indianapolis, Ind., one belt power riveter with 48" stake capable of driving 60 ⅜" cold rivets per minute; Inland Steel Co., Indiana Harbor, Ind., one large splitting shear, 18" blades; Carl Binder Structural Iron Works, Chicago, one 42" belt power punch with architectural jaw and capacity to punch 1" hole in 1" plate; Manitowoc Dry Dock Co., Chicago, one combined punch and shear, 42" throat capacity, 1" hole 1" plate; Garden City Wire & Iron Works, Chicago; one single 18" punch with architectural jaw capacity 1" hole 1" plate; Minneapolis Steel & Machinery Co., Minneapolis, Minn., one single belt punch, 18" throat capacity, 1" hole 1" plate; Christopher Murphy & Co., Chicago, one high speed punch, 18" throat capacity, ½" hole ¼" plate, to run 90 strokes per minute; Raymond Bros. Impact Pulverizer Co., Chicago, one rotary shears to cut ¼" plate, and one set of belt power bending rolls.

The Chicago Pneumatic Tool Co. reports that its air compressor plant at Franklin, Pa., is operating day and night. Among recent sales of importance are two large compound compressors for the New York Central & Hudson River Railroad Co.'s Jersey Shore shops; two large compressors for the Readville Shops of the New York, New Haven & Hartford Railroad; a compound compressor of 2,000 cubic feet capacity per minute, for the Lake Shore & Michigan Southern's Collinwood (O.), shops, being a duplicate of the first compressor installed; a 1,000 foot compound compressor for the St.

Louis, Iron Mountain & Southern Railroad and one of the same capacity for the new shops of the C. C. C. & St. L., (Big Four Railway). The company has also secured the Government's order for the installation of a 1,000 foot compound compressor at the Norfolk Navy Yard. Other sales include five large size straight line compressors to the American Lime & Stone Co., Tyrone, Pa., a 1,000 foot compound compressor to the Mobile & Ohio Railroad for the shops at Mobile, Ala., and one of 500 cubic feet capacity to the Louisville & Nashville Railroad. J. W. Duntley, president of the company, has just returned from a trip to Europe, where American workmen employed by the company are making exhibits in the various ship yards and manufacturing plants of pneumatic tools in operation. The company expects to arrange to duplicate the Detroit plant in Scotland for the production of tools required in the shipbuilding work in that country. The exhibition before the Ship Builders' Federation in Glasgow, recently concluded, was highly successful, and the pneumatic tools have practically been adopted for all the shipbuilding work in the Scotland yards. The American workmen are now in Germany, and from there will go to France for the purpose of making other exhibits.

The Milwaukee Rice Machinery Co., Milwaukee, Wis., is having a prosperous business in manufacturing the Reliance gasoline engines from 2 to 8 horsepower and the Independence brand of leather belts.

The Steam Appliance Co., of Milwaukee, Wis., has recently booked several orders for its Triumph steam and oil separators, among which is one for the new plant of the Allis-Chalmers Co., at West Allis, Wis. This separator is to take care of 3,000 H. P. and has 24-inch inlet and outlet. It is of steel construction and is made for the design type "A" horizontal.

CINCINNATI.

Sept. 30.

The activity of the machinery trade in this city is attested by the numerous extensions and additions to plants which have been and are being made. This feature is so general that the permanency and stability of the business and the good outlook for the future are obvious. There is not a complaining note from any branch of the trade. Orders are plentiful and shops are running to capacity. The ending of the vacation period and the return to business of heads of large concerns have brought in heavier mails, more inquiries, telegrams urging the completion of orders now in hand, and more business generally.

The foreign trade is noticeably increasing. One large Eastern concern has an order for about $200,000 worth of machines to be placed within the next few days, and advices from those in touch with this contract indicate that this city will get at least one half of the order. In regard to the working of the shops everything seems to be moving nicely. Some slight difficulty has been experienced here and there in getting castings, but as a rule foundries are keeping up with the wants of machine builders. Some manufacturers have even anticipated their needs and are carrying enough castings to keep them running some time, even though the lack of coke should force the foundries to close down. Labor is in fair supply but not abundant. Common labor is scarce and high.

There is great activity among the builders of motors. This branch of the business reports heavy orders all along the line.

The close of the South African war has awakened renewed interest in that country. The L. & N. railroad has announced the opening of a steamship line from Pensacola, Fla., to South African ports. Some shipments of machinery have been made recently from Cincinnati to South Africa via New York. A representative of the L. & N. railroad said that it was expected the steamship line would carry considerable traffic in agricultural implements and machinery from this country to South African ports. In this connection the Lingham Timber & Trading Co., with offices at Pensacola, has arranged to carry on all manner of business in South Africa. The company is now building a railroad in that country. It has made requests for catalogues from manufacturers in this city and has indicated that South African markets offer an exceptionally good field for American tools and machines.

The coming meeting of the National Machine Tool Builders' Association, which is to be held in Cleveland Oct. 14 and 15, at the Hollenden Hotel, is attracting much interest among the machinery men. It is expected that a good representation will go from here to the meeting. The subjects to be taken up are not yet announced. Among the Cincinnati concerns which will be represented are the Cincinnati Milling Machine Co., the Cincinnati Machine Tool Co., Cincinnati Planer Co., Cincinnati Shaper Co., Rahn, Mayer, Carpenter Co., Bradford Machine Tool Co., Schumacher & Boye, Lodge & Shipley Machine Tool Co., and R. K. LeBlond Machine Tool Co.

Dr. E. G. Carpenter, superintendent of the Columbus Asylum for the Insane, called on several manufacturers of boilers and laundry machines in the city in the past few days. It is the intention of the asylum authorities to install another battery of boilers and a complete new laundry.

Schumacher & Boye have been making some changes in their plant by erecting an additional gallery in the main shop 40x350 feet and other additions in the way of buildings are contemplated in the near future. About $20,000 worth of additional machinery has been added to the plant. Among the more prominent machines are a Brown & Sharpe largest size grinder, Becker-Brainerd upright miller, a 60x60x24 Cincinnati planer, a 36-inch engine lathe, a 30-inch engine lathe, 18x8 friction head lathe, 18x10 quick change gear lathe, three Dreses Machine Tool Co.'s largest size radial drills, and one Cincinnati Machine Tool Co.'s upright drill with tapping attachment, also an additional 10-ton traveling crane.

Among the exhibits at the Cincinnati Fall Festival, the machinery interest is well represented. The Cincinnati Planer Co. is showing a 24-inch motor driven planer; the Cincinnati Machine Tool Co., a 28-inch drill fitted with patent geared tapping attachment, a new feature in these machines; the Cincinnati Punch & Shear Co., a geared multiple punch machine 72 inches wide, weighing about 14,000 pounds, for punching a series of holes 1 1-32-inch in diameter through 3-16 inch plate in 1½-inch centers; the Cincinnati Shaper Co., a 16-inch back-geared crank shaper and 26-inch triple-geared rack shaper; the Lodge & Shipley Machine Tool Co., a 20-inch improved engine lathe with quick change gear mechanism; the Cincinnati Milling Machine Co., a No. 3 plain milling machine and a universal tool grinder; the Oesterlein Machine Co., a universal milling machine No. 24, and a universal tool grinder; the Warner Elevator Mfg. Co., an electric elevator; the Cincinnati Electric Motor Co., motors from ½ h. p. to 10 h. p.; the Jautz & Leist Electric Co., enclosed type motors 1½ h. p. to 15 h. p., and motor generators for transforming the voltage from 500 to 6 volts and 2,000 amperes, also from 220 volts to 6 volts and 2,000 amperes. These machines are used for deposition of metals. The Triumph Electric & Ice Machine Co. exhibits motors and small pumping machines; the J. A. Fay & Egan Co., a No. 50 band scroll saw in operation, also a special 15-spindle gang dovetailing machine, which has been sold to the Pennsylvania Railroad Co.

J. H. Day & Co. are building a new addition to their plant. It will be a foundry 120x150, storage for patterns, fire proof, 36x120, cleaning rooms, 40x80, and additional room to general plant 64x130, two stories. The work will not be completed until next spring, although now under way.

The Cincinnati Shaper Co. expects to get into its new building at Garard Ave. and Elam St. some time in October. The plant has a shop 90x290 two stories for 30 feet, boiler and engine room, 40x75, and office in front, 30x90 feet.

Greaves, Klusman & Co. are installing a new 125 h. p. Greenwald automatic engine.

The Cincinnati Traction Co. has purchased a lot adjoining the Hunt-Street power house and will erect an addition to the present station. Contracts have been let for additional generating machinery, and as soon as the necessary power can be obtained electric cars will be run over the old Mt. Auburn cable route between Avondale and the city.

The Bullock Electric Mfg. Co. is erecting a large addition to its plant and will use cement for a great part of it. The contractors had the cement on hand, but they did not have the gravel necessary to mix with the cement. They could not get it as every gravel bank in the country is being worked to the limit. In this dilemma the Bullock people took a hand. They hired a crew of men and opened up a new bank on the line

of the C. L. & N. R. R. The gravel thus procured was furnished to the contractors, and the work of building was not delayed. In a measure the manufacturers were forced to this course, as the new quarters are imperatively needed. The company had booked orders for a quarter of a million dollars during the first half of September and is at its wits end to get along in the old quarters.

A number of motors and other electrical equipment will be required shortly for installation in the Spanish Government arsenal at Ferrol. The gun shops at Trubia are now being equipped with motors built by the Westinghouse Electric & Mfg. Co., and gun lathes from the Niles Tool Works, Hamilton, O.

The Cincinnati Machine Tool Co., in speaking of increasing foreign trade mention orders from England, France, Switzerland, Italy, China, Brussels and Cuba. The company is running up to capacity and has been compelled to put in some new lathes recently.

Business men of Springfield, Mass., who contributed $75,000 to induce H. A. Lozier & Co. to build a bicycle plant in that city, will take steps to secure control of the factory unless the American Bicycle Co., receivers, give assurances of a resumption at the Lozier division, which is not likely.

CLEVELAND.

OFFICE OF *The Iron Trade Review*, 1064 ROSE BUILDING, Oct. 1.

Business in machine tools was unusually good throughout the summer, all dealers reporting an advance over the same months of last year. While large sales have not been numerous during September there has been a steady flow of small orders and the aggregate has been larger with most dealers than it was for September of last year. Local dealers in machine tools report that conditions are very satisfactory. Their business has been steadily growing and the prospects for the winter are excellent. Strong, Carlisle & Hammond have been badly cramped for space and have rented the remaining two floors of the building which they now occupy and also the annex, so their space will be about doubled. The W. M. Pattison Supply Co. finds its present quarters on St. Clair St. entirely inadequate, and in about a month will begin the erection of a new warehouse, 200x160 feet, three stories, on the land recently purchased at Hamilton and Lawrence Sts. A spur from the Pennsylvania Railroad Co.'s tracks will be built into the warehouse. This company is now doing a large business in furnishing machinery for mines and finds the demand for new equipment very strong in the bituminous districts. Owing to the strike in the anthracite region the miners of soft coal are working as they never did before to supply the demand.

Large establishments in other States represented by Cleveland agencies, are also doing a heavy business. The local agency of Manning Maxwell & Moore sold a large quantity of machinery during the past month, including a number of heavy cranes for foundries. The Waterbury-Farrel Foundry & Machine Co., whose plant is at Waterbury, Conn., has recently established an office at 263 St. Clair street with Mr. G. R. Lamb in charge and has received a gratifying number of orders. This company has recently made an addition to its factory at a cost of $200,000.

The American Foundry & Machine Co., whose local office is in the Williamson building, is rapidly equipping its large machine shop at the company's new plant at Ravenna. Considerable work has been turned out at the foundry, which is one of the largest and best equipped foundries in the state.

The Reade Machinery Co. reports that inquries for punches are coming in rapidly and that the outlook for fall business is excellent.

The first melting was done this week at the splendid new plant of the Johnson & Jennings Co. on East Madison Ave., near the lake. The site includes five acres and is admirably located on the Lake Shore railroad and a spur of the Pennsylvania railroad. There are seven new buildings. The foundry proper is 110x250 feet and is equipped with most improved machinery, including one 15-ton Shaw crane and two 5-ton jib cranes. There are two 10-ton cupolas, one of which has some new features invented by R. Anderson, the superintendent of the foundry. This structure is of brick and iron, fireproof. The pattern shop is 37x50 feet, two stories. The power house is 39x83, the power being compressed air and electricity. The office building is 50x75 feet, two stories. Other buildings are devoted to the tinware department. The company has carried on its business for 16 years at 690 Seneca St., and increasing demand for its products has resulted in the building of the plant which will take the place of the old one. A general foundry business will be conducted and a larger variety of castings will be made than heretofore.

The McMyler Mfg. Co., Cleveland, is completing its new plant at Warren, O., and will move a considerable part of the machinery from Cleveland to Warren.

The Interstate Foundry Co. will soon have its new foundry running. It is 140x300 feet and is built for heavy castings. It has one 40-ton, one 25-ton and four 5-ton electric traveling cranes. An addition is also being erected to the light casting department, 140x200 feet. With the additions and new equipment the company will be able to do a largely increased business in castings of all sizes.

The Atlas Car & Mfg. Co. is building a large addition consisting of two buildings, 100x250 feet, with electrically driven cranes and other modern equipment. The company has also made large additions recently to its equipment in the old plant, including two cold saws, a large boring mill, and turret machines. The company is doing a very large business in equipping industrial railroads, their cars for mills and mines being popular in many parts of the country. Mines in Washington and Montana have recently sent orders for cars, a steel plant in Pennsylvania has been shipped a number of cars, two rolling mills have been equipped, several hundred ingot cars have been sold, two tinplate mills have been equipped with cars, and many smaller orders have been taken. The company's core oven car is steadily gaining in popularity in foundries.

The Machinery Forging Co. is now installed in its new plant on Hamilton St. near Marquette. All of its equipment is not yet in position, but considerable work has been done and a large number of orders have been received. Harry French is the manager.

Foote, Burt & Co. are now located in the new Balkwill power building on St. Clair St. near Belden. They have the first two floors, 125x55 feet, thoroughly equipped for manufacturing multiple spindle drills. The capacity of the new plant is double that of the old. Among recent sales was a machine for drilling torpedo boat plates, which was shipped to the Isle of Dogs, Great Britain.

The Garry Iron & Steel Co. has just completed a number of large contracts, among which are: Roof for power house, one quarter of a mile long, Lake Superior Power Co., St. Ste. Marie; storage bins for St. Louis Portland Cement Co.; and plant of the Atlanta Rolling Mill & Tinplate Co., Atlanta, Ind.

The Variety Iron Works have completed the construction of the stoves for the blast furnaces of the Cleveland Furnace Co. at Cleveland and Pickands, Mather & Co. at Toledo. Work on the stacks is well advanced.

The General Automobile & Mfg. Co., which recently purchased the plant of the O. P. Clay Stamping Co. on Hamilton St., has purchased land adjoining and will erect an addition.

The Cleveland Pneumatic Tool Co. is very busy in its line of manufacture. The new plant is about one-third completed and will be ready for occupancy about Dec. 1. The company has received some very nice orders from foreign representatives and the domestic trade is keeping up as satisfactorily as it has during the past busy six months.

The Van Dorn & Dutton Co. has put in a large amount of new machinery and increased its facilities for making and cutting gears. This has been made necessary by a rapidly increasing business. The company has a branch under the name of the Van Dorn-Elliott Electric Co. for repairing motors, rewinding armatures, the making of coils, commutators, etc.

Jos. Dyson & Sons have recently put in a large furnace and are doing a large business in case hardening, annealing and carbonizing for the trade.

The C. O. Bartlett & Snow Co. is now pretty well settled in its new plant on French and Winter Sts. and is exceedingly busy. One of its specialties is the manufacture of dryers, both steam and direct heat, and the company finds a demand from manufacturers, large and small, for something to dry the coal; that is, for drying and pulverizing the coal before burning. It

is not possible at present to speak with accuracy on the saving which can be effected from this method, but the company's officers believe that at least 20 percent will be saved in coal, that at least 15 percent will be added to the capacity of the boilers, that there will be practically no ashes and that the smoke nuisance will be entirely abolished.

The Union Machine & Boiler Co., which recently purchased the plant of the River Machine & Boiler Co., is making a number of changes and improvements. A department of structural iron work has been added.

The pattern building of the new plant of the Brown Hoisting Machinery Co. is nearing completion. It is of brick and iron and thoroughly fireproof.

The Cleveland Car Co. is erecting general offices and modern car shops on a site of several acres on the Lake Shore Road, five miles west of the Cleveland union depot, Rockport West Park P. O. The plant will be equipped with up to date machinery for the manufacture of industrial railroad equipment for use in and around iron and steel plants, mines and foundries. It is expected that the plant will be in complete running order by Dec. 1.

The Cleveland Automatic Machine Co., incorporated last week under the laws of New Jersey, is the Cleveland Machine Screw Co. under a new and more appropriate name.

The Snider-Hughes Co., which manufactures pumping machinery, is preparing plans for a new plant to be erected on Willson Ave. at the Erie railroad crossing.

PHILADELPHIA.

Sept 30.

Few months have been more satisfactory in point of volume of business in this market than the one now closing. The aggregate of small business has been very large and perhaps represents the general character of the business done. There are other features, however, which have helped to advance the situation very considerably. Some of the large business which has been in view for a time has matured to the extent that one or two transactions of magnitude have been closed or are about to be closed. One of these, the outfit for the new works of the Fournier-Searchmont Automobile Co., which has just purchased a site with buildings at Trainor, about 15 miles from this city, has been completed, the orders for the machinery being distributed mostly piecemeal. It is estimated that the value of the business placed will foot up in the neighborhood of $70,000, and will cover both metal and wood-working tools and minor equipment. It is assumed that the orders placed will cover the entire regular requirements of the concern for some time to come. But few only of the agents and dealers in the market failed to secure something from these contracts. Another big specification in the market is from the Baldwin Locomotive Works for the equipment of recent extensions to their shops. It is quite possible that the orders to result from this specification will aggregate $175,000 covering mainly machine tools. The items include very few large tools and the idea is gathered that individual orders will not run to large proportions. No orders, as far as can be learned, have yet been placed, but it is not expected that they will hang fire, as the equipment is needed quickly, and time of delivery may cut a good deal of figure in the parceling out of orders.

Another specification of good size is put out by the U. S. Government, covering equipment for the new shops at the League Island Navy Yard, Philadelphia. The bids, which are expected to be numerous, are to be opened tomorrow, and will embrace a 10-ton hand crane; 2 No. 2 universal turret lathes; 2 spindle drilling machines, 13-inch swing; a 41-inch foundry cupola; 3 portable blowers and motors for electric driving; a 3-motor electric traveling crane, 5-ton capacity; a 33-inch planer, 10 foot bed; 2 plain milling machines; a 38-inch lathe, 18-foot bed; a 12-inch lathe, 5-foot bed; a 16-inch single geared crank shaper, 16½ inch stroke; a 26-inch triple geared rack shaper; a radial drill, 5-foot arm; a set of plate bending rolls, to take 8 foot 8 inches between housings; a single punch or shear, 16-inch throat; 2 13-inch speed lathes, 5-foot bed; a horizontal boring and drilling machine, 5-inch spindle; a 12-inch slotter, 12¾-inch stroke; a 24-inch lathe, 10-foot bed; a water grinder; a Fox turret lathe, 19½ inch swing, 6 foot-bed; a 37-inch boring and burning mill; 2 20-inch drills; 2 16-inch back geared screw cutting engine lathes, 6 foot beds; and 2 18-inch back geared screw cutting engine lathes, 8-foot beds. These items are all to be delivered within 90 days.

Williamson Brothers Co., builders of steering gear, and iron founders, have plans and are about to award contracts for two foundries, 158x55 feet and 208x55 feet, respectively. The plans cover liberal facilities for storage of pig iron and sand, and the cupolas, two 72-inch, will be flanked by these supplies. A new three-story building will contain tumbling, core and shipping rooms. In the equipment of the foundries will be two electric traveling cranes and several jib cranes. The concern is absorbing the business of G. Rebmann & Co., iron founders, who for years have operated a plant at 13th and Noble Sts.

The Eynon-Evans Mfg. Co., maker of engineering specialties, has commenced work on an extension to its plant—a new foundry, one-story, 20x80 feet, and a two-story annex, 20x60 feet, the latter having cellar accommodation for sand storage, with a metal storage apartment on the first floor, and employes' washroom on the second floor. The additional equipment required will include cranes, molding machines, and a system of trolley tracks for the pattern storage and stock warehouse which has recently been established in a large building opposite to their plant. The company is very busy. Among the orders just completed is one from the Maryland Steel Co., Sparrow's Point, Md., covering 2 20-inch condensers, 3,500 h. p. each, and 2 17-inch condensers, 2,000 h. p. capacity each; another from the New England Engineering Co., New York, for four large condensers for plants in Norwich, Conn., Catskill, N. Y., New London, Conn., and Lincoln, Neb.

The Barr Pumping Engine Co. is extremely busy and has a great deal of work in hand. Among the larger orders recently booked is mentioned one from Kansas City for a fifteen million gallon pumping engine.

At the Bourse, where most of the machine tool business is done, as far as outside builders are concerned, the different agencies appear to be well satisfied with the existing conditions of business. The representative of Walter H. Foster, of New York, reports a very good month's business. The share of this agency in the Fournier-Searchmont distribution of orders covered two Fellows gear shapers. Considerable business was done in pneumatic appliances, shipments of which included 37 Curtis air hoists to the Pennsylvania Steel Co., Steelton, Pa. At the quarters of the J. W. Creager agency an excellent month's business is reported. This agency got a liberal share of the Fournier-Searchmont orders, including two Bardons & Oliver lathes, a Williams, White & Co. Justice hammer and bulldozer, an automatic knife grinder, six Whitney tool grinders, two Whitney hand millers, a 24-inch Conradson lathe, an 800-lb. Chambersburg steam hammer, and a lot of wood working machinery.

E. L. Martin, agent for the Union Steam Pump Co., Battle Creek, Mich., met an excellent demand for steam pumps in September. Orders for the month include a 12x10x16 pump for Chas. Keightley & Son, Vineland, N. J.; a set of pumps for Jacob Reed's Sons, Philadelphia; a set of pumps for Pedrick & Smith, Philadelphia, for shipment to South America; and a deep well outfit to Jos. L. Champion, Atlantic City.

Israel H. Johnson, Jr., & Co., builders of lathes, had a very good month, their orders covering mostly lathes medium in size. Among the larger orders they mention one from the Bethlehem Steel Co., Bethlehem, Pa., for two 36-in. lathes with extra long beds.

The Franklin Machine Works, Inc., builders of cold saw cutting off machines, and machine tools, report a good business for the month, bookings and shipments both being unusually heavy.

The Espen-Lucas Machine Works, builders of cold saw machines, have received several very nice orders for cold saws.

The Pennsylvania Machine Co. reports orders quite plentiful. Among the larger orders secured this month they mention one from the Maryland Pure Rye Whisky Co., Baltimore, Md., for a large engine, and another from the Newport News Ship & Engine Building Co. for a lot of wood working machinery.

The Harrisburg Foundry & Machine Works are exceptionally busy at their plant, deliveries on orders now being quoted for

February and March. Orders recently booked cover one for two 500-h. p. engines for the Jefferson & Clearfield Coal & Iron Co., for electrical supply service, and a 300-h. p. engine for the Gould Coupler Co.

Thos. H. Dallett & Co., manufacturers of portable drills, pneumatic tools, and boiler makers' equipment, state that business is good with them. Recent orders have been chiefly for small and medium tools, but have been quite plentiful.

The J. W. Paxson Co., manufacturer of foundry supplies, reports the demand for its line of goods as excellent. Foundries in general are running quite full, although hampered by the uncertainty of getting pig iron and fuel. Late orders include one from the Scullin-Gallagher Iron & Steel Co., St. Louis, Mo., for a Paxson-Warren sand blast outfit, and another from Thos. Devlin & Co., Philadelphia, for a cupola and melting equipment for the new foundry at Burlington, N. J.

Philip Smith, who has been operating the Vulcan Facing Mills, Easton, Pa., has formed a stock company and is preparing to put in new machinery which it is said will materially increase the capacity of the plant.

The Baldwin Locomotive Works have set at rest the rumor which gained considerable currency that they were considering the removal of their works from this city to another section. Such a denial was hardly necessary to convince those who were at all acquainted with the scope of the plant now occupied. The feasibility of a removal was settled long ago in the negative. Within the past five years immense additions have been made to the plant, and further additions are contemplated as soon as sites can be obtained. It is the intention of the company, however, to have a good deal of its blacksmith work done nearer the source of supply of material, but it is not expected that this will affect the department in which such work is at present executed. A tremendous amount of business has been booked at Baldwin's during the month, orders including one from the Pennsylvania Rail Road for 250 locomotives, a transaction which will run well up into the millions.

Foreign business is very light and shows no improvement. This condition is attributed by many to the fact that no push whatever is being made by builders to secure orders from abroad.

The Philadelphia Pneumatic Tool Co. reports that in the month of August it broke all previous records in the amount of goods shipped, although from present indications September will establish a new record in that respect. Recent large orders have been received from the Cambria Steel Co., Pennsylvania Steel Co., New York Ship Building Co., Newport News Ship Building & Dry Dock Co., and the Grand Trunk Railway. Foreign orders have been received from Paris, London and Copenhagen. More orders have come in for rotary drills during the past two months than ever before. This company has just added to its machine shop equipment eight engine lathes, two automatic machines, two turret lathes, two grinding machines, one Fellows gear shaper, six drill presses, one universal milling machine, one twist drill grinder and a number of other minor machine tools

INDUSTRIAL SUMMARY.

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New Buyers in the Market and Some of their Wants:—

The Home Pride Range Co., Indianapolis, Ind., has increased its capital stock from $10,000 to $25,000. The company was organized less than one year ago, but on account of the big demand for its products the capacity of the foundry had to be increased and considerable machinery is being added to the machine shop.

The Oklahoma Tool Mfg. Co., of Oklahoma City, Oklahoma, has been incorporated with $30,000 capital for the purpose of manufacuring machine tools. A. A. Solenbeck, Melvin Barnes and M. Felton are the incorporators.

The Irondale Tin & Sheet Mill Co., Irondale, O., is being organized by the citizens of that town for the purpose of erecting and operating a two-mill tin plate plant. The plant of the American Tin Plate Co. at that place has been abandoned and for that reason the independent project is being pushed. The company will be incorporated shortly and will install its mills in the old Furnace Hall plant.

The United States Charcoal Co., of Philadelphia, Pa., has been organized by J. J. Hudson, formerly general superintendent of the Crum Lynne Iron Works, of Eddystone, Pa. He has been elected president of the new company, and P. A. Marvel, secretary and treasurer. An effort is being made to market the stock of the company for the purpose of securing funds to erect a modern charcoal iron furnace.

The Marion Machine, Foundry & Supply Co., Marion, Ind., has been incorporated with $25,000 capital. The incorporators are C. E. Chamberlin, T. J. Burns, Michael Egan, H. L. Erlewine and A. H. Loucks.

The Imperial Pneumatic Tool Co., of North Tarrytown, N. Y., has been incorporated with $100,000 capital.

The Crescent Foundry Co., of Wilmington, Del., has been incorporated with $25,000 capital.

The Morning Star Mfg. Co., of Napoleon, O., capital $50,000, has been incorporated by R. W. Cahill, A. B. Blank, H. J. Saulter, Otto Goainman, D. D. Donovan and E. N. Warden. The company will make threshers, traction engines, etc.

The Zanesville Chemical Engine Co., Zanesville, O., has been incorporated under the laws of West Virginia with a capital of $250,000 and intends to build a plant.

The Cincinnati Southern R. R. will need a large amount of corrugated iron for a freight shed, 400x30 feet, which will be erected near Lincoln Park, Cincinnati.

The Zanesville Railway, Light & Power Co., of Zanesville, O., has been incorporated with $1,000,000 capital stock by George H. Warrington, John Ross, J. M. Finch, E. F. Gunther and Thomas D. Braxton, Jr., all of Cincinnati.

The Mitchell Wheel Co., Miamisburg, O., has been incorporated with a capital of $100,000.

The Lincoln Stove & Range Co., Fremont, O., has been incorporated with a capital of $100,000.

The Barnett Equipment Co. of American, has filed articles of incorporation at Newark, N. J. The incorporators are: Col. Edwin W. Hine, East Orange, N. J., Stephen D. Barnett, and Richard M. Barnett, Forest Hill, N. J. The company owns the fundamental patents granted to Stephen D. Barnett for an automatic device superseding the use of safety chains on railway cars, which have heretofore been operated entirely by hand. The capital stock of the company is $100,000. The offices of the company located at 20 Prospect St., Newark, N. J., and 39 Cortlandt St., New York city. The officers of the company are as follows: Stephen D. Barnett, president; Edwin W. Hine, vice president; Frederick W. Egner, secretary and treasurer; George L. Fowler, mechanical engineer; Benj. W. Tucker, consulting engineer.

The Bartlett Bros. Co., of Cleveland, capital stock $50,000, has been incorporated to manufacture and install heating and ventilating apparatus. The incorporators are James Bartlett, E. B. Bartlett, C. H. North, George C. Stelle and T. W. Hill.

John Knape has opened a machine shop at Grand Rapids, Mich. He has already installed considerable machinery and will make further purchases. He will do a general machine business.

The Imperial Pneumatic Tool Co., of North Tarrytown, N. Y., has been incorporated with a capital of $100,000.

Six warehouses of corrugated iron will be required for the first section of the new deep water pier now under construction at Lorenzo, Marquez, and ten additional warehouses for the second section. Each will be 60 meters in length and 32 meters wide. Eight electric cranes will be bought for the first section and fourteen more will be needed for the second. Further particulars may be obtained by addressing the Governor of Lorenzo Marquez, Portugese East Africa.

Fires and Accidents:—

E. F. Parker's foundry and machine shop, at Imlay City, Mich., burned Sept. 19. The building is a total loss. The machinery was damaged.

The machine shop of the People's Gas Light & Coke Co., Chicago, was damaged by fire Sept. 24. Loss on buildings and contents, $35,000.

A boy attempting to light a cigarette by igniting a piece of oily waste with a spark from the electric device of a gasoline

engine started a fire in the shops of the Winamac Bridge Co., at Winamac, Ind., that did much damage to the interior of the plant. Part of the machinery is ruined. The gasoline tank exploded, but the plant was saved from complete destruction.

The galvanizing department and warehouse of the Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., were recently destroyed by fire. The loss is covered by insurance.

While cleaning out the dust catcher at one of the furnaces of the Duquesne plant of the Carnegie Steel Co., Duquesne, Pa., last Saturday, a mass of hot cinder fell on the men engaged in the work resulting in the death of five and the probable fatal iniury of three more.

New Construction:

The Southern Pacific R. R. Co. has completed plans for building a roundhouse and machine shop at Grant's Pass, Ore., to take the place of the property recently destroyed by fire.

Amos W. Barnes, architect and engineer, Philadelphia, has plans in preparation for a large plant for the manufacture of cement to be built in the Lehigh Valley. It will include a stock house, boiler house, engine house, "raw" mill, clinker mill, coal mill, kiln building, stone building, crusher building and machine shop.

The new plant to be built in Hazleton, Pa., by the Jeansville Iron Co. includes a main foundry building, 537 feet 4 inches by 106 feet; a pattern storage building, 50 by 202 feet, three stories, with basement; a pattern shop, 50 by 74 feet, two stories; a power house, 47 by 86 feet; a three-story stable, 35 by 50 feet, and an office, two stories, 65 by 60 feet. Bids will be opened Oct. 3.

The Ohio Galvanizing & Mfg. Co., of Niles, O., is building a one-story frame addition to its plant, 50x150 feet.

The Garrett-Cromwell Engineering Co., Cleveland, has let the contract for the open-hearth building of the Alabama Steel & Wire Co.'s new steel plant to the Riter-Conley Mfg. Co., of Pittsburg. The Forest City Iron & Steel Co., of Cleveland, has the contract for the blooming mill building, boiler house, gas producer house, stripping building, etc. There will be four 50-ton basic furnaces. For the various buildings 2,500 tons of shapes have been contracted for, which will be rolled in Pittsburg. For binders for the furnaces 200 tons of foreign shapes have been bought.

The Betts Machine Co., Wilmington, Del., will erect an addition to its plant at a cost of $15,000.

The Hendey Machine Co., Tarrington, Conn., is building a three-story brick factory, 60x130 feet. The first story will be occupied by the milling machine department. The company is also installing a 24-ton electrical generator.

The work of grading for the new shops of the Louisville & Nashville R. R., at Louisville, Ky., has been begun. The cost of the plant when completed will be over $1,000,000 and the company will be able to turn out everything used by a railroad, including locomotives and cars.

The rebuilding of the plant of the Hartford Foundry Co., Hartford, Conn., has begun. Early this month operations will be resumed on the part of the new structure which takes the place of the one recently destroyed by fire.

The St. Mary's Spoke Works, St. Mary's, O., have added a wheel department to the plant and it is now in operation. A full line of heavy vehicle wheels will be manufactured. The main building of this plant is two stories, 60x250 feet. The works cover twelve acres and employ 250 men.

The Osborn & Stephenson Mfg. Co., Plainville, Conn., which manufactures metal novelties, has built an addition, 40x75 feet. The company is in the market for turret lathe specialties, dies, punches, small hardware and electrical parts.

The Keystone Mfg. Co., Buffalo, will erect a new building of brick and steel, 80x140 feet. The company manufactures tools.

The Detroit Steel Casting Co. has just completed the erection of an addition, 75x151 feet, which will be used entirely as a molding floor. With this addition, present capacity will be doubled.

The Phoenix Castor Co., Hamilton, O., has purchased the new plant of the Stengle Mfg. Co. at the same place. An addition 50x175 feet will be built immediately.

The Waterbury Machine Co., Waterbury, Conn., will build an additional two-story brick factory and an office building.

The Winchester Repeating Arms Co., New Haven, Conn., will make additions to its plant involving an expenditure of $114,350.

The Duluth Furnace Co., Duluth, Minn., has under consideration some important improvements, including the building of coke ovens and extending the coal and coke dock about 500 feet.

The coke oven plant of the Lehigh Coal & Coke Co. in West Superior, Wis., is to be doubled in capacity the coming winter, and the materials for building the new ovens are being placed on the ground. The ovens are to be completed and ready for use by next spring. A larger engine is being put in. The trestle over which the coal is hauled is to be lengthened about 800 feet, making it 1,626 feet long.

Contracts for the erection of 18 state bridges were awarded by the public works department of the State of Pennsylvania at Harrisburg last week. The Nelson & Buchanan Co., of Chambersburg, Pa., was awarded contracts for eight bridges costing in the aggregate $150,000. The Penn Bridge Co., of New York, was awarded contracts for four bridges costing approximately $200,000. The National Bridge Co., New York, was awarded the contract for the erection of one bridge to cost $63,000; York Bridge Co., York, Pa., one bridge to cost $19,250; W. H. Gulick, Phoenixville, Pa., one bridge, cost $25,100, and the King Bridge Co., of Cleveland, O., two bridges to cost about $105,000.

The Champion Iron Co., Kenton, O., has prepared plans for a new and extensive plant and has purchased a site of 25 acres along the Erie railroad affording excellent railroad facilities. The Big Four railroad will also have a siding to the plant, thus giving the company access to the service of two great trunk lines. The main building, which will contain the structural erecting shop and machine shop, will be 300 feet long and 110 feet wide and will be substantially built of steel and brick. On both sides of the building there will be galleries running its entire length and 30 feet in width each. A traveling crane will run the entire length of this building, having a clearance of 22 feet. Through the center of the building a track will be laid which will enable the loading of material directly on the cars from the erecting floor. The foundry will be 180x100 feet and will be equipped with a crane having a span of 60 feet and running the entire length of the building. A power plant will also be built to contain the boiler plant and engines. The steel work will be erected by the company itself, while the remaining contracts for the erection of the buildings have already been awarded. The equipment of the entire plant will be purchased shortly and will consist of cranes for the main building and foundry, machinery for the erecting shop, machine tools for the machine shop, foundry equipment and boilers and engines.

The Standard Steel Co. will erect an immense hammer shop at Burnham, Pa., to be 600 feet long and 67 feet wide.

Kimball Bros. Co., Omaha, Neb., will erect a small foundry to cost about $1,500.

The Diamond Match Co., Barberton, O., will erect an addition to its present machine shop, three stories high and 300x40 feet. Match making machinery will be manufactured.

The Smeeth Copper & Bronze Co., Chicago, Ill., will erect a new foundry to cost $40,000. The foundry building will be 256 feet long and 75 feet wide.

The Cambria Steel Co., Johnstown, Pa., will erect 200 additional by-product ovens. The coke is to be used in the two additional blast furnaces now under erection.

The Toronto Hardware Mfg. Co., Toronto, Ont., will erect a new foundry at a cost of $20,000.

The foundry of the American Brake Shoe & Foundry Co., at Chattanooga, Tenn., recently destroyed by fire, is to be rebuilt at once on a larger scale. The equipment will be electrically driven.

The Pittsburg District:—

The patent suit of the Best Mfg. Co., of Pittsburg, against the Lawrenceville Bronze Co. and the Republic

Iron & Steel Co. was decided last week in favor of the plaintiffs by Judge Buffington sitting in the United States Circuit Court. The infringement was on a patent plate for cooling furnace boshes.

A meeting of the Central Plow Steel Co., Ltd., was held here last week for the purpose of renewing the agreement another year. Owing to the absence of a quorum the meeting was adjourned, however, and will not be held for several weeks.

Hubbard & Co., shovel manufacturers, have decided to practically double their plant, having acquired a large tract of land adjoining their present plant on Butler St.

The Mesta Machine Co., of Pittsburg, whose plant is located in West Homestead, has been awarded an order from the Tennessee Coal, Iron & Railroad Co. for a pair of 55x66-inch direct coupled piston valve reversing engines. These engines will be of very heavy design and will replace the engines now driving the 44-inch blooming mill at the Ensley plant of the Tennessee company at Ensley, Ala. The company has also received an order from the same company for four blowing engines with steam cylinders 44x60 inches and air cylinders 84x60 inches. These are to replace old engines at the blast furnace plants at Ensley.

The Bessemer Coke Co. has completed 400 new ovens at its Griffin plant in the Connellsville region and will build 200 more ovens at their Geneva Works.

The Columbian Fireproofing Co., of Pittsburg, has decided to erect a structural fitting plant in England, and a site has already been secured at St. John Wood on the Thames. Two acres have been purchased and the erection of the plant will be pushed to an early completion. American machinery will be purchased for the equipment of the entire plant, and L. V. Childs, chief engineer of the company, will shortly return from England to Pittsburg for that purpose. As the fireproofing company is doing considerable business in England it has been found necessary to do the steel erecting as that is the custom in that country.

General Industrial Notes:—

The Wray-Austin Machinery Co., Detroit, Mich., started its new pulley factory at 18th St. and Michigan Central R. R. on Sept. 16. The capacity of the new plant, which is a 50x160 structure, is 150 pulleys a day, which is double the capacity of the factory destroyed by fire in August.

The Carnegie Steel Co. placed a portion of its new armor plate department at Homestead in operation this week. When entirely completed the new addition will double the output of the Harveyising department.

The Mathews Woven Wire Fence Co. of Pittsburg, was granted a state charter last week with a capital of $1,000. It is probable that the plant will be located at Glassport, Pa.

The Sheet Steel Co., of Pittsburg, has been incorporated with a capital of $50,000 by George A. McLean, J. C. Painter, C. C. Poss and W. O. Bollinger. The new company has offices in the Lewis Building, and has taken over the plant of the Tuscora Steel Co. at Newcomerstown, O.

The W. S. Tyler Co., Cleveland, has increased its capital stock from $500,000 to $1,000,000 in order to make additions heretofore noted in these columns and other improvements.

The Searles Furnace, at La Follette, Tenn., owned by the La Follette Coal, Iron & Railway Co., went into blast Sept. 26, making a perfect start. This is the largest furnace in the South, the stack being 95x20, with an estimated capacity of 125,000 tons of iron a year. Mr. John E. Searles, of New York, is president of the company, and H. M. LaFollette, vice president and manager. Very little iron had been sold in advance.

The four foundries of the Champion division of the International Harvesting Co., at Springfield, O., have resumed operations and, as soon as sufficient material is obtained, all departments of the plant will be started.

The Phoenix Galvanizing & Mfg. Co., of Pittsburg, has purchased a new site for the erection of a galvanizing plant along the Allegheny Valley Railroad, formerly owned by the Kane-Maloney Iron & Steel Co. As soon as the new plant is built the present plant on Duquesne Way will be abandoned.

The Superior Drill Co., Springfield, O., is running at night with 500 men getting out drills for the domestic and foreign trade. Several large shipments have been made recently to Europe and Australia.

The American Watch Tool Co., Waltham, Mass, has passed out of existence and the plant has been purchased by the Loop Lock Machine Co., of Boston. In the near future the plant is to be increased by the erection of a new building.

The entire new plant of the new Elmira Rolling Mill Co., Elmira Heights, N. Y., is now in working order. The finishing department was started last week. The product is a high grade of merchant bar iron.

The Helmbacher Forge & Rolling Mill Co., St. Louis., which has recently increased its capital from $300,000 to $500,000, has purchased a rolling mill plant in Madison, Ill., and will soon have it in operation.

A large number of men are at work at the new plant of the O. S. Kelly Road Roller Co., Springfield, O., arranging to start about the middle of October. It will have a capacity of 200 road rollers a year.

The new 10-inch continuous mill at the Brown-Bonnell plant of the Republic Iron & Steel Co. was started Sept. 25. This was the old plant converted into a continuous mill.

The Canton Roll & Machine Co., Canton, O., is working 24 hours a day.

Receivers were appointed Sept. 26 for the Maryland Can & Mfg. Co., Baltimore. The indebtedness is placed at $300,000 and assets at $225,000. Receivers were also appointed by consent for the William Fait Canning Co., indebtedness $200,000 and assets $300,000.

The National Machinery Co., of Tiffin, O., has just shipped two more cars of wire nail machines to the Pittsburg Steel Co., Monessen, Pa., and three cars to the Colorado Fuel & Iron Co., Bessemer, Col. Orders for bolt and nut machinery are coming in rapidly, and the export business, especially with Asia, France and Australia, is exceptionally heavy.

The Western Hardware & Mfg. Co., Milwaukee, is now manufacturing brass and iron beds exclusively. The company formerly manufactured gas and gasoline stoves, but the business in metal beds increased steadily until it was decided to use the entire plant for that line. The company's business is now very large and the demand for the better quality of beds has increased to a marked extent.

The plant of the United States Brass & Mfg. Co., Warren, O., has been sold to E. L. King and C. L. Wood. The company became financially embarrassed some time ago, having liabilities of $35,000 and assets of only $8,000. The plant will again be placed in operation.

The Manson Cycle Co., Chicago, has been merged with the South Western Mfg. Co., Laporte, Ind.

The Republic Iron & Steel Co. will not place its Springfield, Ill., plant in operation until about Jan. 1, 1903. Much new machinery is being installed and there is delay in securing it.

The new blast furnace, under erection at Wheeling, W. Va., by the National Tube Co., will be blown in about the first of the year. The daily output will be about 600 tons.

The Lochiel Furnace of the Pennsylvania Steel Co., Steelton, Pa., was placed in operation last week.

The annealers, picklers and shippers employed in the tin plate mills of the N. & G. Taylor Co., Cumberland, Md., have gone on a strike and as a result the mills have been closed for an indefinite period.

The Tennesse Coal, Iron & Railroad Co. is relining its Oxmoor Furnace, Oxmoor, Tenn., and it will be blown in early in November.

The Waynesburg Forge, Sheet & Tin Mills, Waynesburg, Pa., have signed the Amalgamated Association scale.

The Ideal Stove & Foundry Co., of Daleville, Ind., is negotiating for the removal of its plant to Frankfort, Ind.

The Dake Engine Co., of Grand Haven, Mich., has just filled an order for 13 of its 3- and 5-ton pneumatic chain hoists for the Illinois Steel Co., Chicago, to be installed in the new extension of the North Side plant.

The receivership of the Premier Steel Co., Indianapolis, Ind., has been terminated, the last of the plant having been sold to the Collingwood Steel Co., of Collingwood, Ont. Before being discharged, the receiver, J. E. McGettigan, turned over to the court $200,000 in sealed bonds which were to have been sold by the company when the receiver was appointed.